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The Impact of Emerging Online Video Technology on Traditional Methods of Content Distribution and Audience Engagement

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Thesis Abstract

As a result of advances made in both Internet technology and consumer electronics over the past decade, the web is now providing a free, unregulated platform that allows virtually anyone with a computer to become a broadcaster. Simultaneously, a discernible change in the nature of how television viewers are able to access content is well underway.

This examination will provide a brief history of web-based video since the 1990s, the driving forces behind its evolution, the areas in which this new medium is succeeding, and how traditional broadcast networks are responding. This work will also attempt to gauge online video's potential impact on both traditional television networks and the audiences they are trying to reach in the coming years.

> ...fascination with television and other video content is not easing up, as consumers keep turning to TV, internet and mobile at record levels. Viewers appear to be choosing the best screen available for their video consumption, weighting a variety of factors, including convenience, quality and access. (Holmes, 1)

As the number of people using the Internet as a means of replacing traditional communication and accessing information increased rapidly in the 1990s, the race to provide video content through this new medium was in its infancy. Faced with a multitude of obstacles, web-based video offered more headaches than actual content for both online viewers and content producers. But with technology quickly evolving, the number of people watching web-based video grew rapidly in the first decade of the 21st Century, posing the question: what impact will web-based video actually have on traditional broadcast outlets and how will viewership be affected as a result?

Wide-scale, mainstream use of the Internet as a platform for communication can be traced to the the 1990s. With providers such as CompuServe, America Online, and Prodigy, the core user experience was based around e-mail and traditional news items, such as headlines, sports scores, stock quotes and weather (Caldwell). This experience was built upon a technology infrastructure where these Internet platforms could be reached solely by dial-up modems with extremely limited bandwidth capabilities. Attempts to access larger file formats like digital images could prove to be an exercise in patience, as users would simply have to wait five minutes or more for a single image to finish downloading. Likewise, the ability to access larger multimedia files like audio and video was incomprehensible to some, technologically impossible for most: video cards

lacked the ability to display sophisticated graphics; many computer processors could not handle the data contained in multimedia files; many computers didn't even have sound cards or speakers.

By the middle of the 1990s, however, audio capability had become standardized in many personal computers. With this broader standardization came the introduction in April of 1995 of the RealAudio Player, "one of the first media players capable of streaming media over the Internet" (RealPlayer). RealAudio was able to compress audio to the point where people connected to the Internet with 56 kilobyte-per-second, or "dial-up," modems could listen to live and archived programming from the web. Two years later, it had been rebranded "RealPlayer" and introduced video streaming capabilities.

The experience for most end-users when trying to watch video, however, remained mediocre at best. While 56k modems could support audio, video streaming with these modems looked more like a slideshow, with a new frame appearing every few seconds. File playback often stopped due to Internet network congestion, causing files to "buffer" until enough of the presentation had been downloaded before continuing. Worsening the situation, video window sizes were small, making the display of images more sophisticated than a talking head problematic. By 1998, Microsoft Corporation had unveiled Windows Media Player (Windows Media Player), but for dial-up users, it faced the same limitations as RealPlayer.

A third media player, Apple Computer's QuickTime, was also gaining ground in the late 1990s (QuickTime). Unlike RealPlayer and Windows Media Player, however, QuickTime would not introduce streaming capability in their players until 1999, meaning

users watching videos in QuickTime player would have to wait for, at times, very long downloads. On the positive side for QuickTime, however, was that typically once a file was finished downloading, the playback was quite smooth.

While these fledgling media players were being introduced, the requisite bandwidth for delivering a rich user experience was not widespread. Broadband Internet service could be found in many corporate offices, government facilities and universities in the late 1990s, but for Internet users at home, dial-up was still the only service widely available, with fewer than 1 million cable modem and DSL subscribers in the United States in 1999 (Mendel).

Further complicating online video delivery was the expertise required in order for independent producers to display their content. Even if someone possessed video content they intended to share online, only a select few had the necessary hardware or software necessary to convert the content to a web-compatible file format; others lacked the minimum web hosting space to which a video file could be uploaded; many did not possess the web programming skills that would allow a video to be properly placed on a web page. Combined with the inconsistent user experience for viewers, online video existed as a mere content novelty rather than content practicality. It was against this backdrop of technological limitations, however, that one of the first, professionally-backed ventures into online video delivery was launched.

In 1999, Yahoo! Inc. acquired Broadcast.com for the eye-opening sum of $5.7 billion. In an article regarding the acquisition, CNET's Jim Hu presciently asserted, "Yahoo could use Broadcast.com's technology platform to further develop its own

broadband strategy" (Hu). Less than one year later, Yahoo announced the launch of Yahoo! Finance Vision, "the first live financial network to originate from Silicon Valley" (Yahoo! Unveils).

Finance Vision was delivered through a custom web browser that featured four windows in one screen (Nielsen). The user experience involved a live broadcast of financial news and interviews in the top left, a window to the right that provided content related to the video stream, a small window in the lower left with up-to-the-minute stock quotes, and a larger window to the right that gave users the ability to browse the Internet while watching a broadcast.

From its inception, Finance Vision was met with criticism.

> This looks like a high school TV production with mostly Generation-X types telling us how to invest ... Combine this with a cheap-looking set and a miserable online connection and you have a laughable production ... I can't imagine what would happen if it actually became popular and had to feed even more video streams. The picture, while quite clear, stutters and often stops dead. (Dvorak)

This sentiment on bandwidth was echoed by Jakob Nielsen. However, unlike Dvorak's dismissal, Nielsen offers the assertion that while the negatives of online video in 2000 far out-numbered the positives, if Finance Vision was indeed a "moon shot," then it was time for such a period of trial and error to commence:

> Most users will not have sufficient bandwidth until around 2004. But it is time to start experimenting with true multimedia on the Web. It is not enough to simply stream traditional television at the user: a passive viewing experience is too boring for Web users who are used to being in control. We need integration between multiple media for something to be true multimedia. A single medium (e.g., video) is not enough. (Nielsen)

The many technical challenges facing online video at the time provided major hurdles for Finance Vision. Citing the decline in Internet advertising revenue, along with the slower-than-anticipated adoption of home-based broadband Internet services, Yahoo! canceled Finance Vision in June of 2002 after less than two years (Saunders).

Taking into account both Dvorak's criticism and Nielsen's analysis, the beginnings of a set of standards for web-based video content geared toward a mass audience would, at the very least, include:

1. Technological viability of delivery.
2. Satisfactory production standards for an audience raised on traditional broadcast standards.
3. Ability for end-user interaction.
4. Content that is compelling enough for people to watch.

As of 2000-2001, the ability to meet all of these standards, in particular those grounded in technology, proved extremely difficult. But even with an ever-evolving Internet infrastructure, if online video was going to establish itself as a viable media outlet, it needed to possess more than mere technical capability and higher production value; ultimately, as a fifth standard, it would have to be profitable.

The web was a logical new frontier for content distribution for several reasons. Most significantly, the Internet provided powerful search capabilities that had already had profound effects on retail. If video could be effectively migrated to the web, viewers

would no longer need a T.V. Guide or be forced to scroll endlessly through menus on their television screens in order to find something to watch. Even if they didn't know the title of a program, the viewer would be able to find content by simple keyword searches.

The Internet also introduced better metrics capability in terms of audience measurement and analysis of their behaviors. For over 50 years, Nielsen Ratings ruled television research with its selected audience diaries and "Set Boxes." But these focus groups were small, with the data gathered from only about 10,000 Set Boxes intended to represent the viewing habits of 1,145,000 households in the United States as of 2006-2007 (Segal).

Conversely, many web analytics or statistical programs could measure a much larger segment of a web site's audience, along with greater depth regarding the behavior of users on a given web site. Google Analytics, a popular, free web analysis tool, is capable of tracking anywhere from 90 to 95 percent of all visitors to a given web site (Browser Statistics), a far less random sample than Nielsen had historically relied upon. Beyond overall audience numbers, online statistical software could also track geographic location, time spent on a site or even a specific page, how many pages a visitor accessed, which pages they exited the site from and where the user went, what kind of computer and web browser was being used to access the site, and much more.

Similarly, more definitive statistics were available to advertisers with online campaigns when compared to Nielsen's measuring the effectiveness of television advertising. The total number of times an ad appeared could be reported virtually in real time, but more importantly, how many times that ad was clicked could also be

ascertained. Additionally, many statistical tools were able to track a customer from the time an ad was clicked all the way up through the time that same user purchased a product, resulting in what Internet marketers refer to as "conversion rate" (Conversion). With media marketers constantly investing more in understanding their audiences, the depth of information available to them from web analytics made the medium much more attractive.

During the first decade of the millennium, the adoption of video as a more popular form of content grew in concert with the rise in number of users with home-based broadband Internet. While it had been reported that in 1999 fewer than 1 million U.S. subscribers had DSL or cable modem, by April of 2009 broadband penetration in U.S. homes had surpassed 93% (April 2009 Bandwidth). Personal computers had evolved from the days of being glorified word processors to sophisticated media workstations.

At the same time that the technology necessary for viewing video was evolving, web sites that featured video exclusively began to surface. These platforms provided content creators the ability to upload their video and give it a title, description and even keywords. For viewers, these sites added interactive functionality including the ability to leave comments about a video, rate a video, share the video with friends, or even copy the video to their own web sites or blogs. These features added a level of engagement that traditional media was incapable of delivering.

YouTube, founded in 2005, reported that content creators were adding 65,000 videos a day by the summer of 2006, while the site's audience consumed 100 million views daily (YouTube serves). Between 2003 and 2007, other similar video platforms that

came into being included Vimeo, Blip.TV, Viddler, Metacafe, Revver and Veoh (Comparison of video). Best of all, for end users, these sites were free to use for both content creators and viewers. Due in no small part to these sites, the term "User-Generated Content" or "UGC" (User-generated) had worked its way into the mainstream vocabulary and, more importantly, the standards of both technological viability and user interaction had been met.

With access to distribution now available to almost anyone with a computer, the floodgates were opened for a multitude of new, independent content producers. A visitor to YouTube might see a home video guitar lesson on how to play Led Zeppelin's *Stairway to Heaven*, and then be able to watch a recent clip of David Letterman's *Top Ten*. As of this writing, a six-minute video with a static camera angle of mediocre visual quality showing Judson Laipply's live performance entitled "Evolution of Dance," is the most-watched title of all time on YouTube with 119,689,954 views since April of 2006 (Evolution).

A paradigm shift was occurring. Since television had first entered the mainstream, programmers and broadcasters had controlled the viewing experience, from what people watched to when they watched it. This content was delivered through a broadcast spectrum that was regulated by the Federal Government. While the VCR and ensuing digital recorders such as DVR and TiVo had undoubtedly had some impact on the notion of "appointment television" (Cha) in the 1980s and 1990s, the Internet solidified the fact that broadcasters no longer had monolithic control of the "when" of viewership. With video content distribution now occurring outside of the broadcast spectrum and without

regulation, control of the "what" people watched was also being impacted. The online video experience was ushering in a viewing experience of on-demand and complete control for the end-user.

While the addition of audience variables such as *what* and *when* is at the core of the transformation of media, the impact of location, yet another element, can also be seen. The word *location* is not intended to be interpreted necessarily as "geographic location," although geography is certainly a factor. The meaning for the purposes of this endeavor is to define location as *the routinely occupied spaces where a person has historically lacked the ability to watch video content*. Most people grew up in a home where a single television resided in a living room. Over the years, television sets migrated to the bedroom, the den or study, the rec room and even the kitchen. The majority of television viewership took place inside the home.

Laptops and portable DVD players were the first to provide freedom of location, the latter first appearing in 1998. These devices, though, were not without limitations. Many laptop computers were bulky and heavy; early models didn't even possess DVD playback capability. Portable DVD players remained too limited in their functionality and application, and for some models, product size was also an issue. As with other technological developments, the pace of change could be swift. By 2005, market research predicted that the portable DVD player would reach its saturation point, "as early as 2006" (Portable and Mobile).

Around the same time the portable DVD player market was running its course, smaller handheld devices such as mobile phones, personal digital assistants or "PDA,"

and MP3 players capable of video playback had become readily available to consumers. While screen sizes were comparably smaller, these devices had distinct advantages over DVD players. No video disc was required; they offered more functionality; they could be connected to a user's computer in order to have new content updated regularly; most fit easily inside someone's purse or pocket. These portable devices, most notably Apple's 5th generation iPod (Hormby and Knight), enabled people to watch content essentially anywhere. The freedom of *what* and *when* was now working in concert with freedom of *where*.

But portability, better research on usage, a more engaging user experience and a seemingly endless fount of content still could not overcome many of the glaring problems with user-generated video platforms, and the early exploits of YouTube and others proved to be chaotic. The viewing experience lacked continuity due to both the user-controlled nature of the platform and the absence of discernible content categories or channels; content contributors, likewise, could not always be trusted to provide accurate descriptions and keywords for the video titles. What's more, popular videos could be removed without notice if there was a reported concern regarding copyright infringement (YouTube).

In April of 2009, YouTube received a court order to remove leaked Public Service Announcements denouncing same-sex unions produced by the National Organization for Marriage (National Organization). As a result of these videos being flagged, users revolted by re-uploading saved copies of the video files to YouTube (Poulsen). Similar

woes caused by legal issues and lack of a contextual viewer experience were rampant among all video sharing web sites.

The idea that these sites could generate substantial advertising revenue remained dubious at best.

> YouTube doesn't prescreen any content. The majority of the video clips involve budding musicians, comedians, filmmakers or just people looking for attention. Other clips are grittier. A viewer can often find clips of violent accidents and bloody shark attacks. Sometimes users post clips that include nudity and sexually graphic images. (Sandoval)

While the lack of user regulation had created a platform where anyone could become a broadcaster, the multitude of issues faced by these providers, from decency to copyright, had hastened progress toward a sustainable business model.

Emerging from the disorder was a faction of independent, original content producers who began distributing video in serialized formats. *RocketBoom*, a satirical daily newscast that debuted in 2004, had 130,000 daily viewers by 2005 (Right to the Top); *Wine Library TV*, a daily video blog started in 2006 by Gary Vaynerchuk and filmed in his family-owned wine retail shop in New Jersey, had just under 100,000 viewers per day by the end of 2008 (Robinson); *Diggnation*, a popular web series started in 2005 covering social media, had 200,000 regular subscribers as of 2008 (Sarno).

There were also start-up Internet television networks or “digital studios,” distributing entire series online. *Revision3*, the producers of *Diggnation* and a host of other niche content titles, reported record revenues [no revenue amount is available due to Revision3 being a privately held company], and 6 million total show views per month in the fall of 2008 (Lewin).

These early independent producers of online content were bringing regularity to a medium characterized by disorder, while also setting a higher standard of production quality first called for with Dvorak's criticism of Yahoo! Finance Vision in 2000. Both of these qualities seemed to mimic more of a TV broadcast model than the erratic, cluttered experience of YouTube. Moreover, they underscored a key element to the emergence of online video, and quite possibly the medium's single greatest advantage: the market for niche content. Jeremy Allaire, founder and CEO of Brightcove, a video platform service geared toward larger media entities like Fox, CBS, Showtime, A&E, and the Discovery Channel (Roush), pointed to the opportunity for focused content in an interview on the *Charlie Rose Show* in April of 2006:

> What's turned out to be the case is that the diversity of communities of interest and topics of interest and the accessibility of global information [on the Internet] has been radically empowering for consumers and citizens alike. And I think that is the core of this, which is: if you're passionate about a given arena of interest or a given actor or a given type of comedy ... really any form of information, communication, and entertainment. If you're passionate about that, the Internet is radically more efficient at making that accessible and available... (Allaire)

As a byproduct of this structure of more granular content genres, there was a general consensus among people following the online video boom that while unregulated, user-generated video sites were still searching for revenue models, new advertising opportunities would naturally begin to present themselves to independent content creators. Vaynerchuk of Wine Library TV predicted in February of 2008 that, "If you're a niche video marketer there is more potential for monetizing what you do because you're smaller but focused" (Believe in the Power).

The likelihood of significant advertising dollars being available to even targeted content sites, however, remained characterized by words like "potential." Audience control over the *what*, *when* and *where* of media consumption is, at the least, a very democratic notion, but provides mostly discomfort to advertisers who seek to spread their product messages in appropriate, predictable, and controlled contexts. There was also the issue of saturation, and by the first quarter of 2009, many digital studios and independent producers were being forced to close shop (Whitney). Even *Revision3,* at the same time they were announcing record revenues, let go of one quarter of its staff in October of 2008 (McCarthy).

With uncertainty surrounding online video at multiple levels, particularly the independent, user-generated sector, the opportunity still remained for traditional media companies to leverage both their existing advertising relationships and their content libraries. All that was needed was to find the proper outlet, and media companies began self-distributing on their own web sites while developing other means within their control to offer alternatives to the existing video sites.

In 2006, the television network ABC announced it would make episodes of many of the network's prime-time shows available as both online, ad-supported and paid downloads in iTunes, citing that it was a logical move due to the evolution of the online marketplace (Mahan). That same year, News Corp. announced that FOX would be syndicating selected shows to both MySpace and its affiliate web sites (Duncan). In March of 2009, CBS Sports streamed live games from the men's NCAA Basketball

Tournament with commercials (Tanklefsky). Networks were finding new ways to reinvent their model of distribution.

The most notable of these network efforts was Hulu, a joint-effort of NBC Universal and News Corp. that offered, "commercial-supported streaming video of TV shows and movies from NBC, Fox and many other networks and studios" (Hulu). Debuting in 2007-2008, Hulu had decided advantages over YouTube:

> Unlike YouTube, Hulu had legal access to great content ... YouTube has lots of content, but from the perspective of advertisers much of it is utterly worthless. Nobody wants to tout their brand amid user-generated videos that could turn out to be almost anything ... only 3 to 4 percent of the clips in YouTube's library are able to carry advertising, while at Hulu 100 percent of the library can carry advertising and 80 percent of the streams Hulu delivers have advertising attached. (Lyons)

As a result, in 2008, Hulu was estimated to have generated $65 million in U.S. advertising revenue and $12 million in gross profit, while YouTube earned $114 million in U.S. revenue but continued operating at a loss, despite the latter having approximately ten times the number of visitors in the U.S. (Lyons). By April of 2009, Hulu was poised to become the second most-visited video web site in the U.S. (Seigler).

The initial financial success of Hulu indicated that, however immature, a network model for Internet video existed. It also suggests that while the familiar concept of watching television may be in a state of flux, the market for television-produced content remains strong. Meanwhile, the continued failure to substantially monetize the largest library of video content on the Internet raised further questions as to YouTube's business position. The British firm Deloitte noted in their Media Predictions for 2009:

> ...classification of content to the degree required for advertisers may be impossible to realize. The sites hosting UGC are unlikely to be able to sift manually through each picture, video or status update submitted, due to the volume of work this would involve. (TMT Predictions 2009, 10)

Any comparison of YouTube and Hulu would be remiss if it did not take into account the very principles upon which each platform was founded. YouTube began as a technological solution to the problem of making video easy for anyone to upload and share; Hulu was started as a targeted effort of major media companies to distribute video content leveraged with advertising. The latter had economic viability built-in from its inception while the former's primary objective was less defined when it came to profitability.

As the middle of 2009 approaches, the business of online media remains in a very dynamic state, and based upon Internet video's first decade of growth, it is unlikely this trend will cease in the near future. Much of what will continue driving this change will stem from attempts to resolve the many issues that have typified online video.

Perhaps the most critical of these issues is whether or not user-generated media can be made profitable. At present, it has by far the biggest audience for online video (Siegler), but the longer it's characterized by legal issues, quality inconsistencies and operating losses, the harder it will become for free content platforms to justify their business models. Eventually, someone has to pay for all the bandwidth and storage space online video requires.

Likewise, independent producers and video bloggers have also failed in gaining widespread traction with advertisers and the future of niche content remains unclear. It's

possible that this space could become a platform for large media companies to discover new content and talent, in time, evolving into television's "minor leagues." It also could remain as a type of virtual film festival, where creators will either self-fund their productions or seek outside financing in the hopes that getting their idea online will entice media companies with greater resources.

Audience research for online also has obstacles. Currently, there is no set of standards for online audience measurement, and of the many online traffic measuring programs, each has its own methods of calculating results. Beyond the inconsistencies of these analysis tools, there also may very well be an overabundance of information. Technology and new media writer Daisy Whitney identifies that, as a result, Nielsen's TV ratings system is still preferred over web analytics:

> ... there are some challenges because producers and programmers [of online video] are trying to figure out what exactly is more valuable and what will demonstrate return on investment and engagement that advertisers want to see evidence of ... there are so many different ways you can slice and dice your audience ... which is just confusing for advertisers because even though a lot of them understand the TV ratings system is flawed, it's also familiar. (Whitney)

Until the online video industry can produce a uniform set of criteria for audience measurement, the likelihood of online metrics being considered as reliable as current television ratings systems anytime soon appears unlikely.

An area that bears close scrutiny is the continued development of online network syndication. The major studios remain in a position of strength due to their ownership of television's most popular shows, their long-standing relationships with advertisers, and a

greater collective understanding of their audience measurement techniques. Ventures like Hulu prove that the networks are willing to innovate, while also demonstrating that, although the audience for television in a traditional sense may not be growing, the audience for television *content* is, at the very least, transforming.

Technology has brought about profound changes in how people access their video content, and will undoubtedly continue to do so. It is unlikely, though, that we are witnessing the total demise of traditional television content; television still commands too large an audience, contains too much valuable programming, and offers advertisers the most reliable platform for video advertising. In all probability, what is occurring is the evolution of a new broadcast spectrum, supported by new end-user devices; one that compliments the existing framework of the last half-century, but leverages new innovations like the Internet to give audiences the content they want, when they want it, wherever they may be.

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