Piratez Are Just Disgruntled Consumers

Multiscreen is at the top of the entertainment industry's agenda for delivering digital video. This is discussed in the context of four main screens: TVs, PCs, tablets and mobile phones. The premise being that multiscreen enables portability, usability and flexibility for consumers. But, there is a fifth screen which is often overlooked – the cornerstone of the entertainment industry - cinema. This digital video ecosystem is not complete without including cinema, and it certainly should be part of the multiscreen discussion. In exploring the phenomenon of digital piracy it is fitting to start from the perspective of the movie theater.

Figure i - Multiscreen Ecosystem - From Cinema to Mobile

The magic of the web is no longer about connecting pages and people, but rather about connecting devices and entertainment. As a result there is a renewed focus on capacity and infrastructure, as video - which requires greater bandwidth and storage - takes over the internet.

In today's digital society consumers, expect their content anytime, anywhere, and on any device. The movie theater is the least flexible medium in this regard. Films are shown at specific times of the day, in specific theaters, and within a window of specific dates. This rigidity applies worldwide – consumers know what to expect from the substandard entertainment supply chain.

Moviegoers - or perhaps more accurately, lovers of cinema - are frustrated. Their frustrations begin with the discrepancies in film release strategies and timing. For example, audiences that saw Quentin Tarantino's[1] Django Unchained[2] in the United States enjoyed its opening on Christmas day 2012; however, in Europe and other markets, viewers could not pay to see the movie until after the 17th of January 2013. Three weeks may not seem like a lot, but some movies can take months to reach an international audience. Some take so long to reach global theaters that they overlap the domestic USA Blu-Ray release. This delay can seem like an eternity for a desperate fan. This frustrated enthusiasm, combined with a lack of timely availability, leads to the feeling of being treated as a second class citizen - and may lead the over-anxious fan to engage in piracy.

There has been some evolution in this practice, with certain films being released simultaneously to a domestic and global audience. For example, Avatar[3] was released in theaters on the 10th and 17th of December in most developed markets. But this practice has not yet been institutionalized. Most titles have significant delays between domestic and international releases. This is partly attributed to the lack of a streamlined supply chain; in coordinating press junkets, local advertising, marketing, arranging subtitles or dubbed tracks, film distribution, etc. – all in time for a simultaneous global release. When content eventually moves from a theatrical release to home distribution there are cascading delays for international markets.

The temptation to steal is almost entirely enabled by convenience. Consumers are only a few clicks away from determining who is getting which titles, and when. Some consumers don't have the patience to wait their turn, and simply steal what they want. Impulse buying, when not available, becomes impulse pilfering.

The monetary value of entertainment decays over time. A movie's highest valuation is when it is first released. This is precisely the time when piracy is most rampant and peer to peer (P2P) networks light up. Synchronizing theatrical releases with online entertainment services such as iTunes or Netflix collapses release windows, and gives pirates little excuse to steal. If monetization is addressed early, then this can help to mitigate piracy. As interest decays, so does the cost of the title, and the popularity of piracy follows in-step. This value decay continues through the lifetime of the tile, as they reach broadcast distribution, bargain bins, and migrate towards the long-tail[4] (i.e. a large number of titles viewed or sold in small quantities). As titles lose their popularity, they also become harder to obtain as P2P users stop seeding.

Figure ii - Evolution from the Internet Generation to a Digital Society

This scarcity can have a reverse effect to price decay, by increases its value. It creates an opportunity for providers to monetize long-tail content. If monetization is addressed throughout the title's life-cycle, then this can also help to mitigate piracy.

Another question to address is how titles on peer-to-peer networks are seemingly available before their official release? This is directly attributed to the geographic disjointedness of title launches onto DVD or Blu-Ray. Discs are available earlier in some countries. These are then purchased, ripped, transcoded, and posted onto torrent sites - sometimes weeks before their release in other geographies.

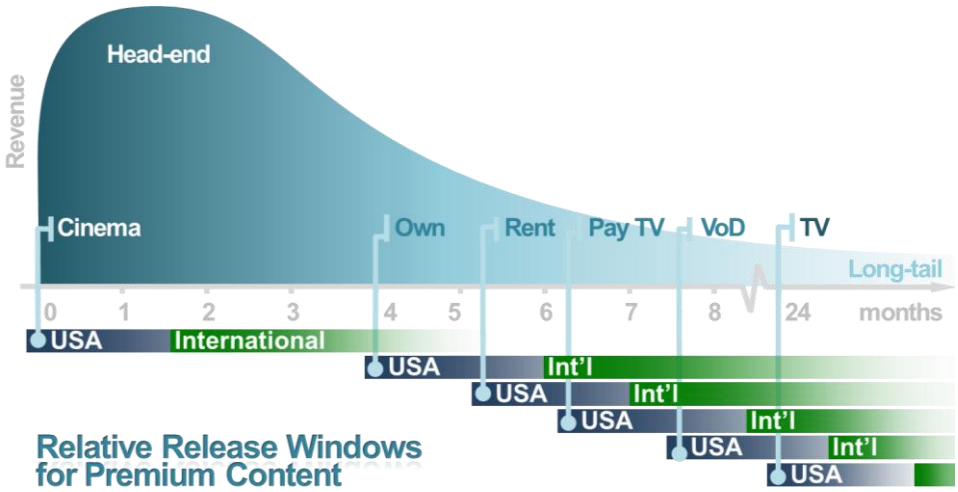

Figure iii – Relative Release Windows for USA Domestic Movies and their International Release

Geo discrepancies in release dates persist for both theatrical and home distribution, giving a geographically dispersed user-base further 'justification' to pirate content. As the largest entertainment market in the world, by revenue, Hollywood suffers the most. Content rights issues play a large role in delays. Content aggregators and distributors in remote locations try to balance the cost of licensing a library against how that investment can be recuperated from local sales and subscription fees. In some cases licensing American content is just too expensive. The return on investment is often not justified, due to lower incomes, a smaller population base, or the lack of potential scale. This results is consumers in remote markets having no means of legitimately purchasing American entertainment, leading them to turn to the internet to illegally download what they cannot legally purchase.

> *From the moment a blockbuster movie is announced, demand grows on a grand scale. Some international markets wait impatiently to see the film in their local theater.*

Segmenting Markets

Regulation used to be easier for content producers and distributors. The simple implementation of varying analog standards (NTSC[4] for North America, PAL[5] for Europe[6], etc) made sales channel protection relatively simple. This analog fencing lasted for decades, through the television and VHS[7] player age. It even survived the advent of the DVD, even though this was already a digital format. Interestingly, the number of geographical segments increased to six[8] – ostensibly in order to better address purchasing power disparities.

For the most part, analog encoding was enough to deter cross border selling[9]. Blu-Ray discs later carried even tighter encryption, but this did not become a major deterrent for piratez (We will explore the reasons for this later).

The intense competition in the consumer playback market (i.e. DVD and Blue-Ray) forced manufacturers and brands to differentiate. Multi-region players became a great competitive differentiator and soon became an expected *feature* effectively nullifying restrictions. Even PC based DVD drives, which had prompted users to 'choose a region' were soon overcome by hacks, making their forced regionalization more of a hiccup than true protection.

Coming back to NTSC and PAL - one alternative was to use broadcast equipment to convert tapes between formats. But this was expensive, and often had undesirable results. This conversion process was mainly an issue if the source material was recorded initially in NTSC or PAL, such as television shows. On the other hand, converting movies was not such an issue, because film could be natively digitized and then encoded into NTSC using telecine conversion[10]. Or for European distribution, content would be sped up by approximately 4% to match the 25fps of PAL (Hollywood movies are usually filmed at 23.976 frames per second, fps).

As computers become popular as a source of entertainment, broadcast standards were no longer an issue, and conversion unnecessary. Computers simply played content natively, in either NTSC or PAL. Leaving content in their original format became the standard approach.

The introduction of high definition (HD) television in 2005 eliminated many more legacy issues. Flat screens (LCD[11] or Plasma[12]), televisions began shipping with multiple support for both PAL and NTSC. Furthermore, HD finally did away with some of the dated aspects of broadcast, such as non-square pixels, over-scanning, anamorphic formatting[13], and finally standardizing on a single color gamut (Rec. 709)[14]. Even interlaced video is now a thing of the past, surmising from the fact that there are no plans for its support in the next H.265 HEVC[15] video coding standard.

The computing industry should be thanked for many of these changes[16]. Computers certainly leveled the playing field by allowing support for multiple formats. Content moved from physical discs to files on computers – from physical media to cloud media – from broadcast to the internet. Geo-political borders that prevented playback of

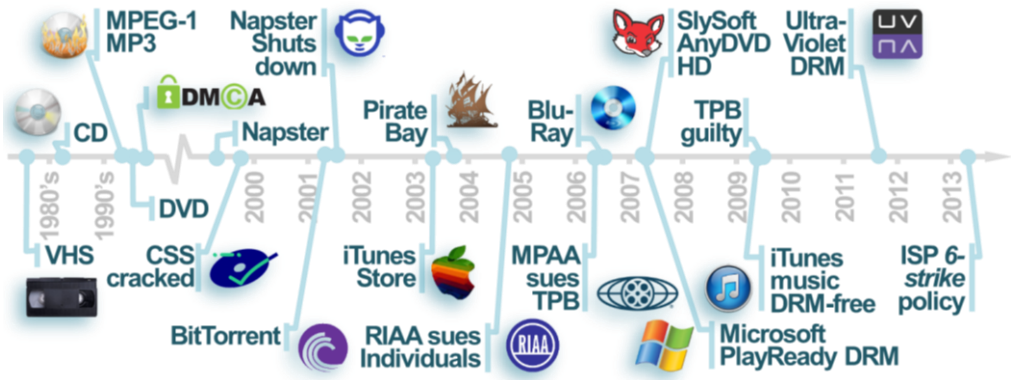

Figure iv – Key Initiatives affecting Global Copyright Infringement

entertainment were erased by computers as well as the expansion of the internet. High definition video helped to harmonize the technical differences that plagued broadcasting standards.

This leveled playing field also created an environment wherein computers could be used to break encryption codes established by the entertainment industry. Software could "burn" discs onto hard drives, and use the internet to distribute pristine copies of content to all corners of the globe. As much as the computer and internet generation helped the broadcast industry evolve, it also opened new doors for copyright infringement on a massive scale.

How Did We Get Into This Mess?

The advent of the audio cassette[17] and VHS tape[18] brought copyright infringement to the broadcast industry. This became a hot topic once it was evident that consumers had the ability to easily record radio or television programs. For the average consumer, the interpretation of copyright law was confusing. Into the 90's consumers were uncertain whether backing up CDs[19] or software was legitimate, even though the practice was wide-spread. A general consensus of how copy written materials could be reproduced was established with the introduction of *Fair Use*[20]. In the USA this law was incorporated into the Copyright Act of 1976, 17 U.S.C. § 107. Ten years after the compact disc was introduced, the Audio Home Recording Act established in 1992 that it was legal to make copies of audio recordings for non-commercial personal use[21]. Fair Use and copyright laws vary on a country by country basis, confusing interpretations of fair usage as technology evolves. Consumers generally follow the principle that making a backup copy is justified if they purchased and have possession of the original CD or software.

Unfortunately Fair Use does not apply to DVD or Blu-Ray. The legal issue with films is not in copying the content itself, but in the circumventing the discs content encryption. The United States Copyright law entitled Digital Millennium Copyright Act (DMCA)[22], passed in 1998 – a little over two years after Blu-Ray began shipping - deals with this subject. The DMCA "criminalizes production and dissemination of technology, devices, or services intended to circumvent measures that control access to copyrighted works"[23].

CD's didn't have these measures in place, because music discs are not encrypted. CD's had no copy protection mechanism while at the same time offering pristine audio quality. With the creation of MP3[24], and subsequent publishing of the standard by the Moving Picture Experts Group (MPEG[25]) in 1993, consumers had the means to store their music collections onto their personal computers, or any storage media such as flash discs. Sales of blank CDs soared throughout the 90's, and in 1997 the MP3 player was born[26]. As flash memory prices decreased, it was possible to carry an *entire* collection of music in an MP3 player. The appeal of digital theft became overwhelming, and the music industry was caught off guard.

Digitization gave users the ability to make pristine copies of just about anything: Music, Movies, Games, and images. The great limitation of analog's consistent reduction in quality when copying-from-copies, became moot. Today's digital copies rival that of the original master recordings.

The entertainment industry seemed to have learned from the mistakes of the audio industry when they released the DVD. Not to repeat the copy infringement disaster of the music industry, the movie industry launched the DVD[27] in 1995 using an encrypted format called Content Scrambling System (CSS[28]). This copy protection mechanism failed four years later when Xing Technologies neglected to encrypt the CSS decryption code in one of their DVD players. This allowed Jon Lech Johansen and two unnamed hackers to reverse engineer CSS, and create DeCSS[29]. Several programs eventually became available which decrypted commercially available DVD's.

The battle against copy infringement continued with Blu-Ray. This platform employed the Advanced Access Content System (AACS)[30]. Despite significant improvements over its predecessors, SlySoft, an Antigua based software company announced their ability to crack commercially available Blu-Rays. They launched a software package called AnyDVD HD[31] on 17th of February 2007[32]. This unprecedented feat happened only seven months after the first Blu-Ray discs shipped.

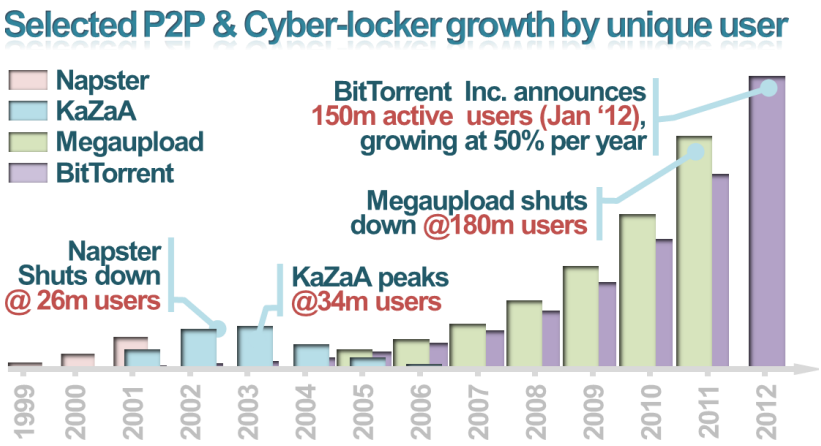

Figure v – Selected P2P & Cyber-locker growth per unique user

AnyDVD HD was the first package removing restrictions from Blu-Ray discs, as well as rendering discs region-free.

Entertainment in a Borderless Internet

With the global expanse of the internet, it was clear that the age of client-server[33] communications, developed by Xerox in the 70's didn't scale well. A new model emerged in the 90's promoting *client-to-client* communications - better known as a *peer-to-peer*[34] (P2P) networking. Launched in June 1999, Napster[35] popularized this model, used mainly to facilitate the illegal distribution of music files. They were shut down two years later due to mounting pressure, related to copyright infringement lawsuits. KaZaA[36] emerged a few months later, and added several improvements along the way. This file sharing service peaked at 34 million users in 2003, but began to shrink once the RIAA announced their plans to sue P2P users[37] on 25th of June 2003. Whereas Napster used a centralized structure for indexing and searching, KaZaA implemented a direct *user-to-user* exchange of information without the need for centralized servers[38]. In other words, when Napster shut its doors, then all subscribers were disconnected from each other. But in KaZaA's case, there was no central source to shut down, making it much more difficult to tear down. KaZaA was later seen to have heralded peer-to-peer's second 'decentralized' generation.

Just as KaZaA launched, the internet was introduced to the third generation of P2P networking: BitTorrent[39], developed by programmer Bram Cohen[40]. BitTorrent quickly gained ground as an extremely effective peer-to-peer protocol. The main difference between P2P's second generation and BitTorrent, was how files were located and traded. Services such as KaZaA and Gnutella were *user-focused* networks - users became part of the network, and sent out direct search requests for files. Responses were then received from other members. Alternatively, BitTorrent takes a *file-based* approach - everyone interested in sharing a file uses a *tracker* to essentially create a network dedicated solely to sharing each file[41].

But peer-to-peer's association with pirated content has resulted in it being synonymous with copyright infringement. Despite this association, P2P has become a viable solution for the legitimate distribution of business and consumer content. Popular subscription services such as Spotify[42] and communications software such as Skype[43] utilize P2P architecture. Possibly one day torrents will be perceived in a more positive light, but for the time being P2P and BitTorrent are *tainted by association*.

To combat piracy, the Motion Picture Association of America (MPAA)[44] and Recording Industry Association of America (RIAA)[45] began an initiative in November 2004[46] to sue individuals for illegally distributing music and films. By June 2006, over 20,000 people in the United States had lawsuits brought against them[47].The initiative eventually stopped in 2008 in favor of cooperative enforcement with Internet Service Providers. The most recent iteration of this entails a *six-strike* policy expected to be enforced sometime in 2013[48]. It involves mounting notifications (*strikes*) by ISPs resulting in throttling the subscriber's internet speed, and threatening other penalties.

As the internet became a more viable platform to deliver entertainment, the only way that content owners would allow their assets to be distributed, is if secure Digital Rights Management (DRM)[49] solutions existed. Apple was one of the first to popularize the online distribution of music when it unveiled the iTunes Store[50] in April 2003. FairPlay DRM[51] was used to allay the music industry's fears of copy infringement. Apple managed to convince content rights owners - namely EMI, Sony, Universal and Warner - to release their libraries to Apple. In an interesting turn of events, Steve Job published an open letter to entitled *Thoughts on Music*[52] in February 2007. The letter encouraged music publishers to remove DRM from their content. Two years later Apple removed DRM from their music library, but maintained protection for video.

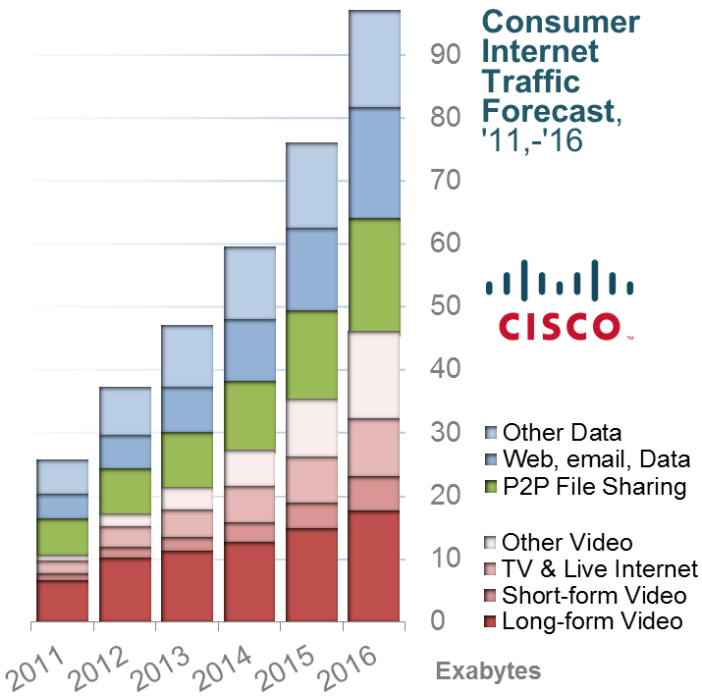

Figure vi – Internet Consumer Traffic Forecast '11-'16

Since the turn of the century, album sales have suffered a steady decline – both in unit sales and revenue. The hope was that online distribution would reverse this decline. But even though sales of singles have soared, it has not been enough to compensate for the lost revenue from the sale of complete albums.

The same month that Steve Job published his open letter to the "big four" music companies, Microsoft entered the online content protection space with PlayReady DRM. This platform protects content when videos are streamed over the internet, and can be used on various portable devices. (Coincidentally this was the same month that SlySoft announced their aforementioned AnyDVD HD hacking software).

Both Apple and Microsoft have been successful in their in the development of DRM solutions, but consumer pressure has been mounting requiring the need for cross-platform portability. A new standard and protocol named UltraViolet[53] may come to the rescue. UltraViolet lets consumers purchase a DVD or Blu-Ray movie, either physically or digitally, and allows them to watch a digital version of the title on selected portable devices. This is achieved through the use of a "digital locker" that stores user rights and allows movies to be viewed onto many different screens without having to repurchase the same title multiple times. The main benefit of this solution is its cross device portability of content and its lack of reliance on a single corporation. UltraViolet is backed by over 70

industry players.

Internet piracy has maintained a steady growth curve over the past decade. Figure v shows that piracy continues to rise, with 150 million active users of BitTorrent networks as of January 2012 according to BitTorrent Inc.[54]. The storage and streaming service Megaupload based out of Hong Kong had 180 million registered users before shutting down in January 2012[55]. Preventative measures have not appeared to deter the growth of piracy on an international scale. On one hand, it has been argued that the proliferation of piracy enhances the global promotion of content. The borderless nature of the internet certainly enables a wider propagation of content, for better or worse.

So what is the role of social media in piracy and the entertainment industry? Although still in its infancy, companies such as Trendrr[56] track the relationship between social media chatter and TV ratings. Social networks such as Facebook and Twitter have been identified as a valuable resource to gauge consumer behavior and viewing preferences in real-time. Netflix is even turning to P2P networks to assess social behavior in consuming entertainment. Kelly Merryman, Vice President of Content Acquisition at Netflix has been quoted, as saying that the popularity on file-sharing platforms determines, in part, what TV-series the company buys[57]. While this is interesting, the entertainment industry won't be thanking internet piracy for its recent successes.

Some proponents of piracy argue that the act of copying[58] is not strictly theft, since the physical act of theft is viewed as the removal of an item from its owner. Their opinion is that piracy is one of copying, and not displacement of the original item. Whichever way you define it, under the umbrella of copyright law, copyright infringement is a criminal offense.

Cisco forecasts that video streaming will take up nearly half of all global internet traffic by 2016[59]. A further 19% will be used for P2P file sharing - 18.9 exabytes of data, or the equivalent of sending an astonishing two billion HD movies over the web (Figure vi). In any protection strategy, content is only as robust as its weakest link. At the moment, the weakest link in the entertainment industry is the circumvention mechanisms available for DVD and Blu-Ray. Next generation protection methods such as 4K UHD content will require far superior protection methods to fortify these assets.

In some markets, peer to peer traffic has declined. According to Netflix, "BitTorrent traffic in Canada dropped 50% after Netflix started there three years ago"[60], attributed to the success of OTT (over the top) services. These online services offer consumers a cost effective, extensive, flexible and immediate on-demand entertainment platform. Consumer purchasing behavior in the presence of an OTT service suggests that if a viable alternative to piracy is available, then they will likely pay for it, and have a little reason to steal content..

Turning Piratez into Consumers, Part II & III

In Part II of "Turning Piratez into Consumers", we will further explore issues surrounding piracy, in the form of a gap analysis of what consumers want from their entertainment. We will look at Music, Film, TV, and Gaming individually, and gauge the health of these markets in light of rampant piracy.

In Part III of this series, solutions to reducing the epidemic of internet piracy will be explored from the vantage point of a subscriber wish-list.

Read Additional Articles in this Series

I. Consumption is Personal

- http://dusil.com/2013/02/28/consumption-is-personal/

In the days of linear television, broadcasters had a difficult task in understanding their audience. Without a direct broadcasting and feedback mechanism like the Internet, gauging subscriber behavior was slow. Today, online video providers have the ability to conduct a one-to-one conversation with their audience. Viewing habits of consumers will continue to rapidly change in the next ten years. This will require changes in advertising expenditure and tactics.

II. Granularity of Choice

- http://dusil.com/2013/04/01/granularity-of-choice/

The evolution from traditional TV viewing to online video has been swift. This has significantly disrupted disc sales such as DVD and Blu-Ray, as well as cable and satellite TV subscriptions. With the newfound ability to consume content anytime, anywhere, and on any device, consumers are re-evaluating their spending habits. In this paper we will discuss these changes in buying behavior, and identify the turning point of these changes.

III. Benchmarking the H.265 Video Experience

- http://dusil.com/2013/04/22/benchmarking-the-video-experience/

Transcoding large video libraries is a time consuming and expensive process. Maintaining consistency in video quality helps to ensure that storage costs and bandwidth are used efficiently. It is also important for video administrators to understand the types of devices receiving the video so that subscribers can enjoy an optimal viewing experience. This paper discusses the differences in quality in popular video codecs, including the recently ratified H.265 specification.

IV. Search & Discovery Is a Journey, not a Destination

- http://dusil.com/2013/05/13/Search-and-Discovery-Is-a-Journey-not-a-Destination/

Television subscribers have come a long way from the days of channel hopping. The arduous days of struggling to find something entertaining to watch are now behind us. As consumers look to the future, the ability to search for related interests and discover new interests is now established as common practice. This paper discusses the challenges that search and discovery engines face in refining their services in order to serve a truly global audience.

V. Multiscreen Solutions for the Digital Generation

- http://dusil.com/2013/06/24/multiscreen-solutions-for-the-digital-generation/

Broadcasting, as a whole, is becoming less about big powerful hardware and more about software and services. As these players move to online video services, subscribers will benefit from the breadth of content they will provide to subscribers. As the world's video content moves online, solution providers will contribute to the success of Internet video deployments. Support for future

technologies such as 4K video, advancements in behavioral analytics, and accompanying processing and networking demands will follow. Migration to a multiscreen world requires thought leadership and forward-thinking partnerships to help clients keep pace with the rapid march of technology. This paper explores the challenges that solution providers will face in assisting curators of content to address their subscriber's needs and changing market demands.

VI. Building a Case for 4K, Ultra High Definition Video

- http://dusil.com/2013/07/15/building-a-case-for-4K-ultra-high-definition-video/

Ultra-High Definition technology (UHD), or 4K, is the latest focus in the ecosystem of video consumption. For most consumers this advanced technology is considered out of their reach, if at all necessary. In actual fact, 4K is right around the corner and will be on consumer wish lists by the end of this decade. From movies filmed in 4K, to archive titles scanned in UHD, there is a tremendous library of content waiting to be released. Furthermore, today's infrastructure is evolving and converging to meet the demands of 4K, including Internet bandwidth speeds, processing power, connectivity standards, and screen resolutions. This paper explores the next generation in video consumption and how 4K will stimulate the entertainment industry.

VII. Are You Ready For Social TV?

- http://dusil.com/2013/08/12/are-you-ready-for-social-tv/

Social TV brings viewers to content via effective brand management and social networking. Users recommend content as they consume it, consumers actively follow what others are watching, and trends drive viewers to subject matters of related interests. The integration of Facebook, Twitter, Tumblr and other social networks has become a natural part of program creation and the engagement of the viewing community. Social networks create an environment where broadcasters have unlimited power to work with niche groups without geographic limits. The only limitations are those dictated by content owners and their associated content rights, as well as those entrenched in corporate culture who are preventing broadcasters from evolving into a New Media world.

IX. Turning Piratez into Consumers, I

- http://dusil.com/2013/10/25/turning-piratez-into-consumers-i/

IX. Turning Piratez into Consumers, II

- http://dusil.com/2014/07/15/turning-piratez-into-consumers-ii/

X. Turning Piratez into Consumers, III

- http://dusil.com/2015/05/12/ott-multiscreen-digital-video-series-10-turning-piratez-into-consumers-iii/

XI. Turning Piratez into Consumers, IV

- http://dusil.com/2015/05/26/ott-multiscreen-digital-video-series-11-turning-piratez-into-consumers-iv/

XII. Turning Piratez into Consumers, V

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Content Protection is a risk-to-cost balance. At the moment, the cost of piracy is low and the risk is low. There are no silver bullets to solving piracy, but steps can be taken to reduce levels to something more acceptable. It is untrue that everyone who pirates would be unwilling to buy the product legally. It is equally evident that every pirated copy does not represent a lost sale. If the risk is too high and the cost is set correctly, then fewer people will steal content. This paper explores how piracy has evolved over the past decades, and investigates issues surrounding copyright infringement in the entertainment industry.

About the Author

Gabriel Dusil was recently the Chief Marketing & Corporate Strategy Officer at Visual Unity, with a mandate to advance the company's portfolio into next generation solutions and expand the company's global presence. Before joining Visual Unity, Gabriel was the VP of Sales & Marketing at Cognitive Security, and Director of Alliances at SecureWorks, responsible for partners in Europe, Middle East, and Africa (EMEA). Previously, Gabriel worked at VeriSign & Motorola in a combination of senior marketing & sales roles. Gabriel obtained a degree in Engineering Physics from McMaster University, in Canada and has advanced knowledge in Online Video Solutions, Cloud Computing, Security as a Service (SaaS), Identity & Access Management (IAM), and Managed Security Services (MSS).

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Tags

- AACS, AnyDVD, Apple, BitTorrent, Blu-Ray, Broadcast, Cisco, Connected TV, Copyright Infringement, CSS, DeCSS, Digital Millennium Copyright Act, Digital Rights, Digital Video, DMCA, DRM, FairPlay, File Sharing, Gabriel Dusil, Infringement, Internet Piracy, Internet Video, KaZaA, Megaupload, Megauploader, Motion Picture Association of America, MPAA, Multi-screen, Multiscreen, Napster, New Media, Online Video, OTT, Over the Top Content, OVP, P2P, Peer to Peer,

piracy, Piratez, PlayReady DRM, Recording Industry Association of America, RIAA, Ripping, SlySoft, Smart TV, The Pirate Bay, TPB, Ultraviolet DRM

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