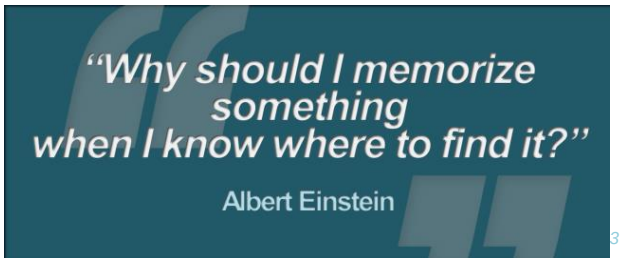
Search & Discovery Is a Journey, not a Destination

Gabriel by Dusil

Searching for content has significantly evolved in the past ten years, thanks largely to Google[1]. Consumers don't even realize how much things have changed, and how fast we can find what we're looking for. Those that are old enough to remember the 80's TV experience or earlier, discovering new content was reliant on commercial previews to entice us to watch up-and-coming programs. The popularity of TV Guide[2] helped untether viewers from these teasers, and allowed searching for future programming schedules in a magazine format.



[3]

Regardless, tuning into broadcast TV was restricted to watching specific channels, during specific timeslots. Viewers needed to reserve that window in their daily schedule. Prime time[4] (between 8pm and 10pm) was established as the most lucrative timeslot in a channel's 24 hour transmission. Broadcasters faced the constant challenge of juggling their content to optimal times, to suit the target audience - a practice that continues today.

The electronic programming guide (EPG[5]) gained traction throughout the 90's and became a modern attempt to discover new interests. Instead of browsing a week's programing in paper format, subscribers were doing so on the lower third[6] of their TV monitors. Although the notion of *searching* was still out of reach - especially in the context that consumers are familiar with today. EPG did not meet the depth of search sophistication that is expected in today's digital generation. It also lacks modern search features that subscribers expect, such as content *suggestions* or peer-based *recommendations*.

The linear experience in TV broadcasting can be directly compared to how the PC experience entered the lives of consumers. When computers first came into the home, PC's were arranged similar to television programs – in directories (akin to TV channels),and files (TV episodes) - albeit with greater flexibility and deeper tree structures.

After several years of evolving PC usage, computers became a cluttered mess of scattered files. As files grew in quantity and size, so did the number of directories. That's when the organization of digital lives took a downward turn. Hundreds of directories littered PC's in deep and forgotten tree structures[7]. And the same mess was repeated with emails. Inevitably, users would spend more time trying to organize their files, than actually using them. Some would even spend hours on end, arduously dragging files from one place to another. It felt like a Sisyphean[8] task, constantly repeated in the hopes that one day the user would remember where he put that important file.

Figure i - From Channel Hopping to "Googling"

Google helped fix that problem by significantly improving the search paradigm (hoping to remind us of how effective their algorithms are, Google always displays the duration of your search. Who isn't impressed with 1.5 million hits in 0.2 seconds?) This approach led to software that would achieve similar search speed, accuracy, and *ease of use* on the PC. Users no longer had to remember where they put their files. All that was needed was to remember a word, or phrase that was used inside the document, and to a good level of confidence, the file would be found. The proficiency that web surfer's achieved from *googling*[9], translated to the desktop. Gradually there was no longer a need for all those directories. The organization of digital lives changed from endlessly moving files around the computer, to ensuring they had meaningful file names and metadata[10] so that they could be easily searchable. Whether files were in one directory or one hundred, they could be found just as quickly.

Fast forward to today, and files have grown in size, quantity and frequency, that are orders of magnitude

Figure ii - Evolution of Video Consumption

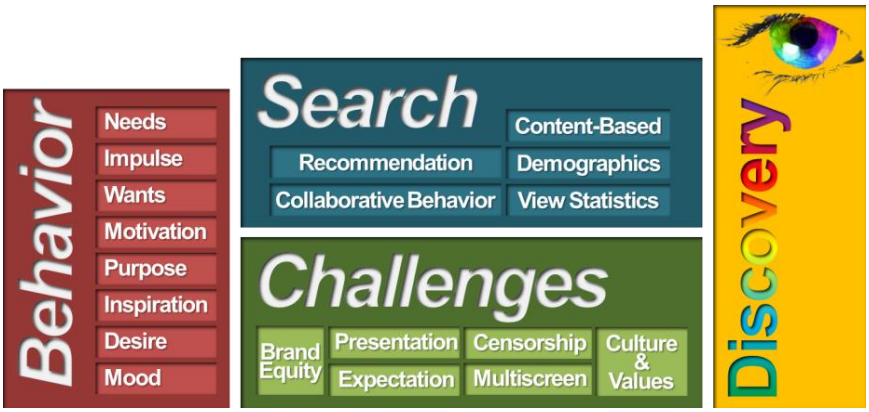


Figure iii – The Challenges of Search & Discovery

higher than ten years ago. Content is accessible at any time anywhere, and on any device. Computers now consist of multimedia libraries - images, music, and videos. The need for metadata is even more important for these files because there is no inherent text from which to catalog them. Metadata comes in two forms:

- **Structural** – For photos this may be the timestamp of the photo, exposure, shutter speed, or geolocation where it was taken. For a video or audio file this may include the bitrate, overall duration, and compression codec used.
- **Descriptive** – For photos this may include the names of people in the images, and the event being photographed, For music this would include the artist, song, and album titles. Or for movies this may include the actors, directors, and producers of the title. IMDB[11] (Internet Movie Database) is a good example of descriptive metadata for movie titles.

This embedded metadata forms the index needed to find multimedia files that do not have a textual base.

Search & discovery is now an industry in itself fueling its own revenue streams. Users can now discover interests which were previously inaccessible. Operating systems have followed suit. For example, modern iterations of Microsoft Windows 8[12] and Apple iOS[13] have a relatively flat structure from a user perspective. Programs are now accessible from the home screen or adjacent screens that are a swipe away. Deep directories and file structures are still there, but hidden behind an elegant front-end. Digging deep into our memories and remembering where we put something is now archaic.

To better understand the evolution of search, and the consumption of video we need to start with an understanding of user *behavior*. Subscriber needs have evolved to a more complex set of search parameters. These engines now juggle a dense set of algorithms to present results that appease the consumer's behavior. To do this, multiple algorithms are at play:

- **Collaborative Behaviour**[14] compares the subscriber's past behaviour with other subscribers with similar activities, and clusters similar interests. In other words, users that liked *Lord of the Rings*[15] also liked *Batman, the Dark Knight*[16].
- **Content Based** search ties related content together. If a user likes the director, *Peter Jackson*[17], then they may like the movie, *King Kong*[18], which he directed.
- **Recommendation engine**[19] which takes behaviour to a more proactive model by asking subscribers for their opinion, then presenting their collective user ratings.
- **Statistical searches** display cumulative totals, such as the number of views, Like's or the amount of reviewers - suggesting a level of popularity for that content.

Due to the global nature of a video subscription service, a subscriber should be presented with search results that are relevant to their geolocation[20]. They also should not be bombarded with irrelevant or inaccurate results that cannot be monetized due to restrictions in rights management, censorship, or DRM[21] (digital rights management). This applies to any associated advertisements as well. In the same spirit as Google's "Do You Feel Lucky", subscribers want search results that are immediately relevant. Challenges facing modern search engines include:

- **Demographics** and **Culture** add their own level of search complexity, as results are altered due to a content rights or censorship. Results may be filtered or not shown at all.
- Advertisers also want to have their brands shown prominently - Whether it's on a mobile, tablet, TV, or laptop – and have their products displayed adjusted to content that complements their brand.

This leads to a wider discussion is on the rights to censor results, freedom of speech, and the manipulation of search results to suit big brother[22]. How much leeway should be allowed in order to control search results in the presence of sponsors, political influences, media brands or internet governance?

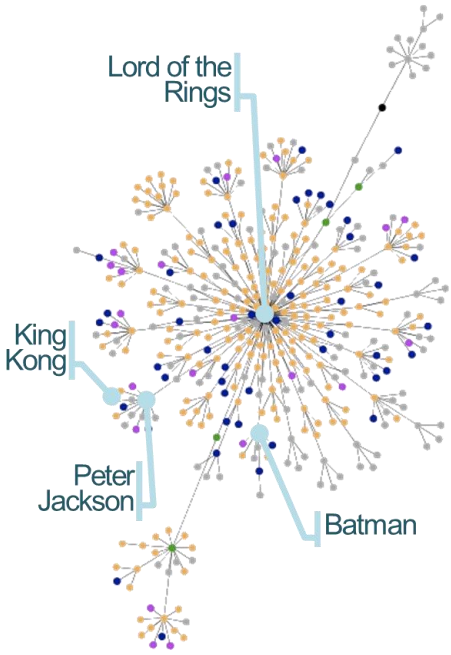
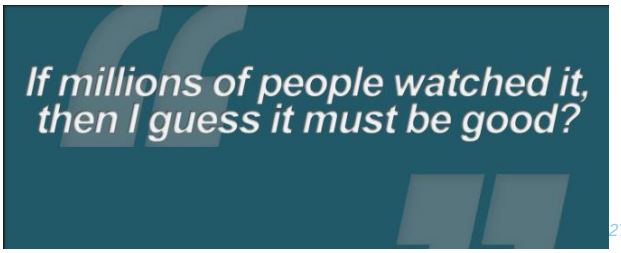


Figure iv - Collaborative Search Engine clusters

Online search algorithms continue to face the challenge of increased accuracy. In the pursuit of excellence, Netflix ran an open contest in October 2006, to improve their collaborative filtering algorithm. The competition was awarded in September 2009 for 1 million US$ to *BellKor's Pragmatic Chaos*[23] which improved the accuracy of the Netflix algorithm by 10.06%., After thousands of man-hours, the algorithm was never implemented, due mainly to the implementation costs involved, according to Netflix sources[24].

Search engines and their related services may already be considered a mature market but there is still room for improvement. Several online music services allow subscribers to find artists of similar interest through graphical means similar to collaborative engines[25]. Google recently enabled the ability to drag a photo onto their search bar so that similar images could be found[26]. IMDB has mapped 2.3 million titles. The value of monetizing such a database was recognized by Amazon.com, resulting in their acquisition of IMDB in 1998. The beneficiaries of these search and discovery improvements continue to be subscribers.



[27]

Future challenges include a continuing correlation of as may data points as available. Then making sense of the results. How can peer suggestions correlate better with statistics, past viewing, and collaborative results? How can search data correlate better with purchase behavior, and the overall personal profile of the subscriber? How can video consumption map to musical or photographic interests? How can search better integrate with personal verses business interests? Could a discovery engine reach a level of sophistication that offers search suggestion better than a close friend? Then again, would we want that level of intimacy with a computer algorithm?

This may be a lot of questions to ask at the end of an article, but isn't that the foundation of search and discovery?

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

- http://dusil.com/2015/09/22/ott-multiscreen-digital-video-series-12-turning-piratez-into-consumers-v/

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

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