

Content growth, exploration tools, signification structures

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ABSTRACT

The current IPTV development, in its aim to differentiate from competition, both along the feature and/or their content richness based offerings seems to arrive at a deadlock at some time in the near future. It seems without difficulty to identify that these trajectories will lead to either a massively over-engineered service and/or an unmanageable content offering and thus providing little added value to the customer.

This paper examines this issue, both from a theoretical and practical approach. Theoretically by considering insights that can be gained from social information foraging theory. Practically, by suggesting potential ways out of the dilemma, that build on technical affordances and enhanced EPG data, by having them working more in the background as supporting elements and not as the primary means of user information interaction.

Categories and Subject Descriptors

H.3.3 [Information Storage and Retrieval]: Relevance Feedback

General Terms

Algorithms, Design, Economics, Experimentation, Theory.

Keywords

Content growth, value, signification structures, exploration tools

1. INTRODUCTION

The IPTV development, seems to already be or shortly arrive at an uncomfortable situation. Now that basic implementation of non-linear TV features have been established in the form of Timeshifting, DVR capabilities as well as VOD offerings, the growth of the subscriber base is hoped to manifest earlier business plan assumptions.

Since subscriber uptake seems to be somewhat slower than hoped for, typically IPTV operators as well as corresponding system providers ponder over questions such as which features to implement and/or channels to add to the already rich content offering and more importantly, how many potential new

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subscribers this will address and harvest. More abstractly trying to identify relevant drivers for substantial shifts from analog or digital TV to IPTV, essentially to provide the necessary returns for the substantial investments made.

Given increasing competitive pressures in these early years in gaining relevant market share (based on ideas of low switching esteem on the side of the user once he has decided for a digital TV provider), it is assumed that the trend to follow the current two trajectories will continue, not the least because so many of these seem untested, despite the fact some of these ideas have been around for decades, and indeed were already tested before.

This seems also to reflect uncertainties about the social use of TV today and how this might have shifted since the first ideas for Digital TV were born as well as the widespread usage of the web, which is seen as a substitute for some of the uses of TV and some user groups.

An analysis of the social uses of TV would go well beyond the scope of a short paper. Nevertheless it is assumed for this paper, that TV remains an important entertainment medium which also acts as a window to the world.

Chapter 2 attempts to draw some parallels between the development of the web and that of digital TV. In particular which regards to ever increasing wealth of content available in both mediums and ways to handle it.

Chapter 3 then builds on this theoretical analysis and proposes two practical ways out of the identified dilemma.

2. Parallels between the Web and digital TV

2.1 Content development

Crude parallels can be identified from the development of the two mediums. One is the immense growth of available content in both mediums. A brief look at the development of web documents indexed by search engines helps highlighting this.

Billions Of Textual Documents Indexed
December 1995-September 2003

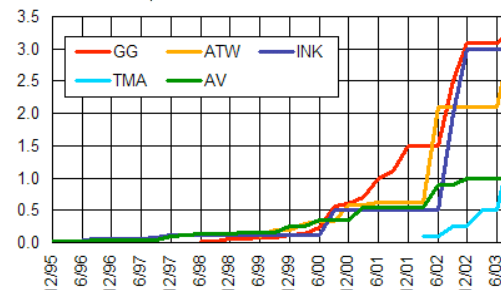


Figure 1: Growth of Search Index Size by September 2003

Although the extent of content is clearly somewhat more limited on the digital TV side, there is nevertheless already a significant wealth of content available at any moment and this choice is surely growing. Starting with large bouquets of free to air as well as pay TV channels, Video on Demand offerings, the current introduction of catchup TV and access to TV Archives as well as DVR features such as series-recordings, which automatically records whatever continued stream of programmes a user defines as a series. The introduction of web content to the digital TV world through access to VideoPortals such as YouTube.com will obviously significantly add to that.

A quick summary of these positions magnifies the point.

Table 1. Typical IPTV Content Offering

Source	Instant consumption	Two weeks period
Linear TV	200	140'000
DVR Archiv	100	100
VOD	1'500	1'500
Catch-upTV	7'000	
TV Archiv	1'000	1'000
Trailers (TV/Cinema)	2'000	2'000
Web Content	1'000'000+	1'000'000+

This rough overview should help signify, that at any moment, the available content assets are already in their multiple thousands or even millions when considering convergent aspects of web and digital TV.

2.2 Navigation and limitations

In this section I will briefly consider the various tools available in the two mediums for exploring this increasingly rich environments, starting again with the web world.

Typically users of the web, in most of the western world, access the web on a pc with a fully blown keyboard and usually a mouse. This basic set up in combination with the availability of search engines (algorithmic and social), portals and the webs interlinking structure, helps user browsing the web at an effective speed.

If we consider the methods available to the digital TV user to explore the respective content offering, which is generally limited to zapping, reading and deciding on the basis of EPG data (at best sorted by categories) and basically a thumb and a remote control, it seems even more an already overly rich content availability given the exploration tools available. Of course there are also the TV Magazines and newspapers as a social form of recommendation. One only needs to briefly imagine how it would be exploring the web via a TV remote control and an EPG Guide to understand its shortcomings even for merely 10'000 potentially interesting assets in a TV world.

The point I want to highlight here is that the current modes available to explore digital TV content, foreclose the possibility

for the user to reap the benefits of the extended content offerings he buys into. If this value add cannot be made accessible effectively in everyday use, chances are that user inertia or even frustration sets in which is likely lead to little or no added value from the large content offerings provided, neither for the user nor for the operator in customer satisfaction and/or revenue terms.

So is there something we can learn from the web?

2.3 Social Information Foraging

Information foraging theory seems to provide intriguing insight regarding user behaviour with web browsing and web search results. This is a theory concerned with information-intensive tasks in the newly emerging field of Human Information Interaction (HII). Human Information Interaction “adopts an information-centric approach rather than the computer-centric approach” of HCI². Its aim is to explain the behaviour and decisions of users when looking for information. Its basic argument is that when users look for information, they constantly assess the cost and benefits involved in staying on a Website, trying to find more valuable information or moving on to another Website, and when to eventually stop the search. Part of this constant assessment is an initially set goal. The evaluation of cost and benefit involved in searching further information is constantly contrasted with this initially set goal and followingly the assessment of the ‘cost’ involved in finding a new and valuable information patch (Website).

An important concept within information foraging theory is ‘information scent.’ When foraging for information, users rely on cues in the information environment, typically the text that describes hyperlinks, to assess the potential gain in following it. When following a cue within an information patch seems to involve greater cost than the potential benefit gained, users switch information patches. This behaviour is all the more supported by two conditions.

Firstly, the Web as an information environment has evolved as highly hierarchical when represented as a network in relation to its citation structures, consisting of hubs and authorities. Hubs are Websites of great popularity which heavy many outward pointing links to Websites which rank high in authority such as for example the new york times. Authorities, on the other side, are Websites that have many hubs and Websites pointing to them such as for example a website from a scientific journal.

Secondly, through Google’s preferential ranking of potentially valuable information patches, based on its popularity based PageRank algorithms. Thereby signifying low switching cost to other and potentially more valuable information patches.

In relation to cost/benefit analysis, it can be said that relying on hubs and authorities, as practised by Google and most of the other major search engines, signifies more ‘efficient’ search outcomes than those involved in the case of a serendipitous approach.

When considering the current digital TV environment in light of the user behaviour as well as the information structure of the web, a number of key differencies can be identified.

Information patches are available in the form of channel brands. Furthermore, hubs and authorities are non-existent, generally speaking, no such interlinking structure exists. Information scent may bestb be compared to the user capacity to use zapping as an efficient methods to quickly decide whether he or she likes a program or not, based on the actual video/audio ‘assessment’.

Zapping as a search & navigation method seems to retain significantly more favourable economics compared to EPG Guides and TV Magazines as a decision basis for live TV watching. Nevertheless, it obviously follows much more a serendipitous approach, at best supported by crude orientation on channels as information patches. While switching cost remains low due to zapping as an efficient exploration tool, it is questionable to what degree channels are able to act as information patches and signify value correspondingly. While the development of niche TV channels seems to provide some level of authoritativeness, it remains difficult to imagine how users will learn about new channel brands and what they stand for, to appreciate their value. This seems particularly difficult, given that signification structures as available in the web world are mostly absent in the TV world.

While zapping might still be acceptable within a limited range of assets such as was available in the analog TV world, surely it will be increasingly problematic with sharply increasing content offerings in the digital TV world as set out in the previous paragraph.

A number of operators currently evaluate the implementation of software based recommendation engines to better support their users in their TV behavior. While this might provide support in some areas, a number of challenges typically appear:

- TV often is used as a multiuser device, identification of user is nearly impossible and similarly. Providing adequate and timely recommendations is challenging.
- Ephemeral character of linear TV content is significantly different from more static types of content such as music, books and movies.
- Metadata for TV programmes very often is incomplete, typically descriptive information is only partly available, episode information is inconsistent, category and genre information is vague and disputable.
- At least, currently it remains to be proven, that recommendation engines also work in the TV content world.
- Lastly, recommendation engines often follow an approach based on interpellation. Data selection is interior rather than exterior to a given set, hence no improvement in the overall data pool is possible.

I want to stress in particular the last point. Recommendation Engines necessarily rely on interpellation, largely because hubs and authorities are not (yet) existent in this area. Furthermore, their blackboxed operation does not support processes of social diffusion, particularly also since referencing to socially acceptable hubs and authorities is not possible.

Furthermore, the announcement of new content sources in Barker Channel promos, on the service Website as well as in newsletters, might not provide enough incentive to consider analysing this new information patch.

To summarise, the analysis in this chapter aimed at highlighting sharp differences in signification structures in between the two mediums discussed. It also compares different search & navigation methods applied and highlights the fact, that while the development of available content has been abundant in both mediums, signification structures in the form of hubs and

authorities as well as improved means to handle these scales efficiently only evolved in the web environment.

3. Practical approaches

While still research in progress, I would like to describe two potentially interesting approaches to the dilemma.

3.1 “Last night a TJ saved my life”³

Building on the previous analysis regarding extensive content growth, one approach to support its exploration in the digital TV world, would be to provide users with content recommendations from specific persons and institutions, which act as hubs and authorities, or also known as Television Jockey’s (TJ’s). A user would typically be provided with a selection of TJ’s to choose from and he could subscribe to these. Each TJ would suggest a number of programs per week and for a period of time. Through the availability of DVR’s, the suggested programmes could also be automatically recorded.

For example a user interested in travel programs and documentaries, could subscribe to the LonelyPlanet TJ, or a movie aficionado could subscribe to the movie playlists from Woody Allen or the Cohen Brothers, or of course multiple TJ’s in parallel.

Similarly, for kids programs an authority could be in the form of an educational institution or . In the case of pop culture oriented teens, this would be in the form of popular bands as TJ’s (hub or authority).

When a recommended program from a TJ starts while the user currently watches a different channel, a notification would be shown. Alternatively, the recommended programmes are also highlighted in the TV Guide, or can be seen in TJ’s suggestion list.

Typically, the suggested programs could cover FreeTV and PayTV, VOD offerings as well as (Video) Content from the web. A subscriber to a specific operator content offering, would only see those recommendations, that are available within the specific offering.

Over time, a large set of personal recommendations would build up. However, in contrast to algorithmic recommendations from a recommendation engine software, those by TJ’s are based on associations with the persons or institutions identity, values and interests and therefore potentially much clearer and longer able to signify social relevancy and generate the necessary curiosity to engage with it. Given, the at least partly repetitive nature of TV Content, these recommendations could be re-used many times over in the longer term future, in particular also for new subscribers to a TV service who have missed the initially recommended broadcasts. Just imagine the following two recommendation messages you receive from your TV-System in a situation 10 years from now:

“Woody Allen has recommended this movie in 2008, for its outstanding martial arts scenes.”

“This movie is recommended, because of high popularity in 2008 and a high relevancy to your current viewing habits.”

Clearly, in the former case, the value of the recommendation seems to fade much less, than in the later case. Even if one

particularly dislikes Woody Allen, it would constitute a much clearer message than the one based on algorithms. The blackboxed operation of algorithm based recommendations cannot live up to that signifying potential over a longer time period. Over time, under the TJ paradigm a citation structure could emerge which has some similarity to the web.

Also, an algorithmic recommendation engine software could typically build on this ecology and suggest connections between TJ's that seem much more powerful than the odd collaborative filtering system-message today.

Lastly, relevant TJ's could easily be identified on both a national and an international level. Think about it, wouldn't it be interesting to have part of ones media consumption mediated by some distant but now networked person of interest? Which ones would you prefer?

3.2 ZapCat

More feature oriented and regarding navigation, building on zapping as an almost natural (if not to say institutional), exciting and highly economic content exploration tool seems mostly unexplored, apart from the browse bar feature.

Enabling the user to actually zap within selected categories would seem much more favourable than the textual display of categorised EPG information, which forces the user to go back and forth between the EPG guide and the actual content viewing. Being able to select for example movie as a category and then zap from movie to movie, rather than from channel to channel searching for a movie, seems to provide a more exciting and effective way to explore ones immense content offering.

When a user selects a specific category and starts to zap within it, the system would take the user first to movies within his selected favourite channels and default language. Typically the system would start with a movie on linear TV, which has just started and then upon user zapping go to the next which has less residual broadcast time. Once no more linear TV movies are available, there would be seamfull switch to non-linear TV content, either from the DVR Archive or when available from catchup TV services. Again, when this section is exploited, there would be another seamfull switch to VOD's for which the user would be able to see trailers first.

Following this approach, the system would reap the benefits of available EPG metadata to provide additional exploration means

to the user which seem much more exciting. Once a suitable movie has been found, the user could still hit the info button to get additional information about the movie, parts of which could also be the persons or institutions that have specifically recommended it.

4. Summary

To summarize, the paper has aimed to identify two key issues in the current development of IPTV and its aim to differentiate from competition. It did so by extrapolating its current development trajectories and compare this to the web environment. Applying Social Information Foraging Theory, it is recognised, that signification structures as they have emerged in the web seem only partly available in the TV content world, at best in the form of channel brands. However, these seem mostly incapable of supporting customers in their content exploration, in particular for the increasing wealth of new content available. The paper builds on the insights from social information foraging theory and suggests to start establishing similar signification structure based on content recommendations from well-known persons and institutions, which are typically associated with specific values, interests and imaginaries.

Lastly, the paper suggests a second practical approach how the benefits of available program metadata can be reaped, to more naturally explore the wealth of content without having the user interact directly with the data, but actually build his interaction upon it.

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