iFanzy: A ubiquitous approach towards a personalized EPG

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ABSTRACT

iFanzy is a personalized TV-program guide offering users a helping hand in selecting their ideal television evening in an unobtrusive way. By combining a Web application, a set-top box EPG and a prototype mobile interface, iFanzy offers a true ubiquitous environment through which users can select and receive personalized TV content. Background information, both data from various heterogeneous sources as well as ontological knowledge repositories, is used to build an integrated RDF/OWL knowledge structure. This semantic graph combining domain knowledge with program metadata is the basis for iFanzy's main functionality which includes intelligent search and generation of context-sensitive recommendations.

Categories and Subject Descriptors

H.4 [**Information Systems Applications**]: Miscellaneous; H.3.3 [**Information Search and Retrieval**]: Information Filtering

General Terms

Design, Experimentation

1. INTRODUCTION

The television industry is looking at a fundamental revolution which will change our television experience fundamentally. On the provisioning side, large amounts of television content comprised out of broadcasts, IP channels and user generated content will be available and soon flood currently existing (both electronic as paper) program guides. On the consumer side, the availability of all this content will inevitably lead to the situation where all this content will be made available for various kinds of devices and interfaces (e.g. TV on the mobile phone). These changes bring new possibilities and challenges that affect the whole media chain: from content production, via distribution, to last but not least the user. With iFanzy[1], a personalized Electronic Program Guide (EPG) developed in collaboration between Eindhoven University of Technology, Free University of Amsterdam and Stoneroos Interactive Television[2], we have the ambition to find solutions to the upcoming challenges in fields like Information Retrieval, Human Computer Interaction and Recommender Systems. We believe that via smart personalization strategies we can make sure that a user will always enjoy exactly that content he is most interested in at exactly the time, place and device (like a mobile, a set-top box television combination, a Website, etc.) he chooses. In effect, this leads to the user spending more time with these devices, and in turn gives iFanzy the ability to constantly closely assess and interpret the user's situation enabling the recommendation of the currently best programs available.

Such an advanced level of personalization among other requires: a rich set of metadata describing all the content, a good understanding of the user's profile including context, feedback and preferences and the semantics of all this data to make a algorithm 'understand' and interpret it. To do so, we rely on a combination of Semantic Web techniques and integration of RDF (Resource Description Framework) and OWL (Web Ontology Language) sources of background information, including both domain ontologies like WordNet[3], TV-Anytime[4], Geonames[5], FOAF[6] and OWL Time[7], as well as external data sources like IMDb[8] and XMLTV[9].

Several other recommender systems have been described, each one trying to recommend television programs in a personalized way. In [2] they propose a recommender which looks at predefined stereotypes and preferred user watching times while taking the composition of the current audience e.g. a family into account. Acknowledging the sparsity problem in collaborative recommenders, [3] tries to improve it by using data mining techniques to discover similarities between programs. [1] also uses semantic Web techniques to

[1]http://www.ifanzy.nl/
[2]http://www.stoneroos.nl/
[3]http://www.w3.org/2001/sw/BestPractices/WNET/wn-conversion.html
[4]http://www.tv-anytime.org/
[5]http://www.geonames.org/
[6]http://www.foaf-project.org/
[7]http://www.w3.org/TR/2006/WD-owl-time-20060927/
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[9]http://www.xmltv.org/wiki/

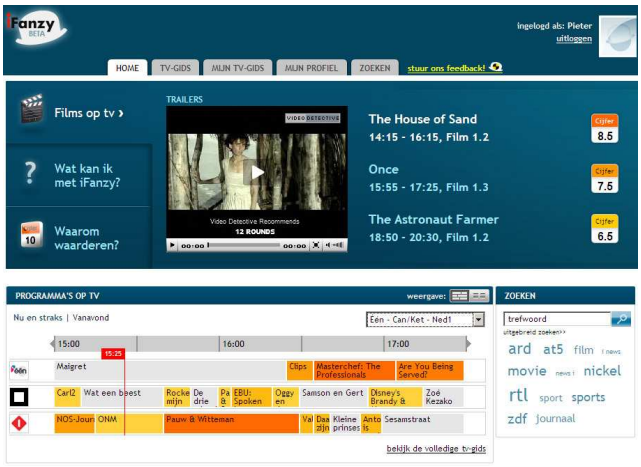

Figure 1: The iFanzy Personalized Program Guide

Figure 2: The iFanzy set-top box interface

improve the quality of their recommender system. However we differ in the fact that we combine and integrate information from various heterogeneous live data sources.

2. IFANZY

iFanzy was built to provide a seamless and ubiquitous television experience to the user independent of his choice of platform. Currently iFanzy consists of an Web application, a Personalized EPG or PEPG on a set-top box and a prototype interface on a mobile phone. Each of these platforms is carefully tailored to support the user with the functionality mostly expected from the respective platform. Behind the scenes, all three connect to the same server assuring their mutual synchronization of data. Thereby guaranteeing that every action performed on any of the platforms, has an immediate effect on all. If the user for example rates a program on the Web portal, the set-top box (STB) will take this rating into account when calculating new recommendations.

In figure 1 and 2 we see the interface of the iFanzy Web and set-top box application respectively, both when a user is logged in. In figure 1 we see the home page with in the bottom left a small PEPG listing three channels. The programs shown on these channels get a specific color ranging from very soft toward very strong orange, indicating how well this program fits with the profile of the current user. In this way the interface provides a recommendation for the programs playing right now. For a more elaborate overview, the interface also contains a large listing which can be found under the tab 'TV-GIDS' showing all the channels in the system, colored accordingly in shades of orange. However, the small PEPG differs for everyone as it shows the three most appreciated channels of the current user, either indicated by himself or deduced from his program ratings.

Next to the PEPG, on the right, the front page shows a search bar to look for specific content accompanied by a tag cloud showing the most popular search terms. The iFanzy search takes various semantic relations into account e.g. relations between genres, between words, etc. If a user for example searches for the keyword 'football', all programs with any relation to this specific keyword are found but also all programs with a relation to 'soccer' (a hyponym relation in WordNet) or 'basketball' (a sibling ball sport in the genre hierarchy) will be found. The strength of the semantic relation between the concepts determines the ranking of the program in the search results. Furthermore, whenever a program is clicked, a window slides down providing both all the metadata describing this program (including a video if applicable) as well as a set of program functions like "Add to favorites", "Record", "Set reminder", etc. In figure 2 we see that the STB interface is tweaked to match the properties (e.g. resolution) of a television screen. Furthermore, at the bottom of the screen we see that specific iFanzy actions are coupled to the well known colored buttons on the remote control for the user's convenience. A user can log in on the set-top box, by selecting his name and providing a pincode via the remote control. Any new account made via the box also immediately becomes a valid account on the Web.

3. CONCLUSIONS

In this paper we described iFanzy, a multi-platform personalized EPG, which helps the user in finding his way through an ever growing forest of information. By offering a ubiquitous environment which can be accessed from a mobile, a PC or right from the living room, we are confident that users will discover iFanzy's added value in their daily TV watching routine. Currently we have a test running with 50 participants, and another one planned on 500 set-top boxes in Dutch households, to scrutinize our ideas.

4. REFERENCES

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