

# iFancy: Personalised Filtering Using Semantically Enriched TV-Anytime Content

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## ABSTRACT

The ongoing media digitalization is creating opportunities to bring new interactivity to the traditional TV concepts. The XML-based TV-Anytime standard for TV content description is tightly coupled to the MPEG-7 ontology. We translated the TV-Anytime ontology to OWL by making use of an existing OWL version of MPEG-7. We defined mappings to existing ontologies for time, geography and linguistic concepts. The demonstration of the iFancy personalized electronic program guide shows our ontology-based approach to personalized access to TV content considering the user context and providing semantically-meaningful recommendations to viewers. The approach involves proper modeling of the domain and of the additional knowledge that is included in the system, as well as data transformations that match the ontological knowledge.

## Categories and Subject Descriptors

H.4 [Information Systems Applications]: Miscellaneous

## General Terms

Interactive TV

## Keywords

Semantic annotation, multimedia, electronic program guides, personalization

## 1. INTRODUCTION

While the Web steadily but continuously keeps its advance towards a full-blown user-adaptive content collection, other similar content providers like television broadcasters are lagging behind. Various studies show the need for personalization in dealing with the massive TV content [6]. Content providers search for ways to put all their content

at a digital visitor's disposal. However, this creates new demands regarding personalization [2], handling diversity of users and/or groups of users, interaction and content explosion issues [1] on an even more diverse scale. The process of integrating content collections from different heterogeneous sources and presenting them to the users in a personalized and context-aware manner demands a good understanding of both the content we are dealing with and the users using it [3]. In this paper we concentrate on the use of ontology-based knowledge in enriching the personalized interaction with content collections. We introduce the iFancy personalized electronic programming guide for ambient home media environment. It is a collection of filters for retrieving and presenting incoming TV content according to user preferences, characteristics and contexts for TV viewing. It is designed and implemented in compliance with the TV-Anytime-OWL based architecture of the Blu-ray Interactive System. The demonstrator presented in this paper is a collaboration between Eindhoven University of Technology, Stoneros Interactive Television and Philips NL in the context of ITEA funded Passepartout project.

## 2. BLU-RAY INTERACTIVE SYSTEM

The software called Blu-ray Interactive System (Blu-IS) illustrates an ambient home media environment to enable ontology-based personalized access and interaction with digital TV content. Blu-IS is a connecting point for home devices, such as shared (large) screens, personal (small) handhelds, hand-gesture recognition and biosensor-based interfaces. The Blu-IS system is responsible for the personalization of the user-content interaction satisfying the diverse requirements of different users, and intelligent information filtering in order to prevent an information overflow as the abundance of available TV content will be very large. Fundamental in our approach is the use of ontology-based modelling of the media content and user information in order to incorporate ontological background knowledge in the user's access to the content collection 1. In this way, we achieve optimal expressivity and semantic relations of the TV content. We have translated the TV-Anytime classification into an OWL ontology and realized mappings to time [4] and GeoNET [5] ontologies in order to achieve more dynamic handling of the otherwise static TV content descriptions, and provide users with flexible composition of relevant content packages. The use of lexical thesauri, such as WordNet, allows us also to refine user queries with synonyms and other word forms. When the user posts a query, the Blu-IS uses

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ESWC '06 Budva, Montenegro

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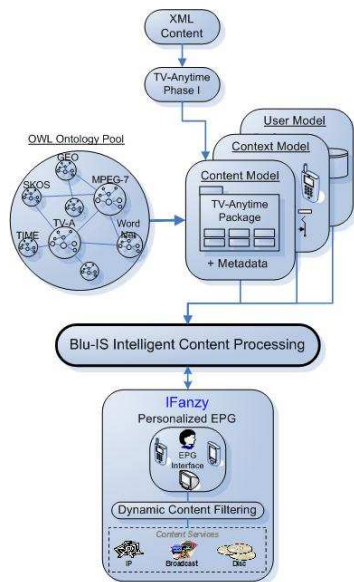


Figure 1: Blu-IS

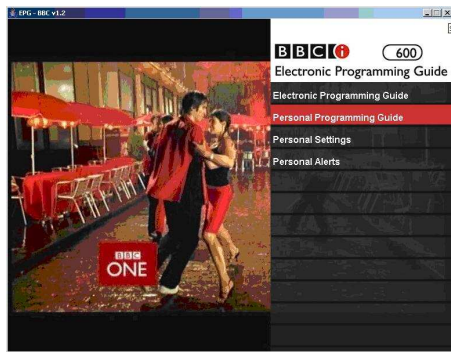


Figure 2: iFanzzy Screenshot

the ontological knowledge, in terms of background, context and user knowledge, and constructs a corresponding refined query to the content repository. Thus, it adapts the result to the needs of the user or group of users and ranks them according to their relevance. For example, the user can ask for all the content available in a particular time frame, specific location or on a preferred topic. After filtering the relevant content it is presented to the user in a packaged form, including not only the TV programs, but also related content from the Web, such as soundtracks, posters, pictures, etc.

### 3. IFANZY PROGRAM GUIDE

The iFanzzy electronic program guide 2 uses the Blu-IS semantic-based information management for the realization of TV content filters considering the user and user's context.

It allows XML-based content to be mapped to the TV-Anytime metadata schema and further organized in TV-Anytime content packages. iFanzzy is developed as a Java application currently using real BBC program stream provided by the BBC web site. It consists of a set of filters, which can be extended depending on the demand for filtering criteria. Currently, we have developed the following filters 3:

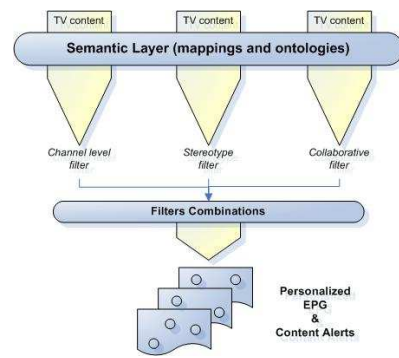


Figure 3: iFanzzy Filters Overview

- Channel level filter: The user can add/delete a channel to the preferred set of channels. Channels not contained in the set of preferred channels are not shown in the iFanzzy.
- Stereotype filter: Every user is matched to a set of stereotype users. Every stereotype group of users has their own preferences and viewing behavior.
- Collaborative filter: Based on the viewing history of the user, the user is matched to a set of other users with the same interests and preferences.

## 4. CONCLUSIONS

The goal of the iFanzzy demonstrator is to how semantic annotation of TV content and modeling of domain, user and context can provide an efficient alternative to the existing theme channels - dynamic composition of TV content packages based on data semantics and user profile and context.

## 5. ACKNOWLEDGMENTS

This research is supported by the European ITEA Passepartout project. Special thanks to Rop Pulles, Peter Hulsen from Philips NL, and Geert-Jan Houben, Tim Dekker and Erik Loef from TU/e.

## 6. ADDITIONAL AUTHORS

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