

SEMANTIC TELEVISION – A NEW VISION OR A NEW BUSINESS CASE APPROACH ? - INTERACTIVE MEDIA BASED EDUTAINMENT REALIZED AS WEB 3.0 ENVIRONMENT

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ABSTRACT

The main objective of this paper is to introduce an idea and vision of new kind of interactive television and broadcast – the semantic television, as a merging of Web 2.0 characteristics and Semantic Web technologies and methods. In this sense semantic television is defined as accessing and processing existing knowledge as well as creating new TV related content and information pools formalized using semantic web techniques and methods. Distributing of adequate formalized TV content is realized as a Web 3.0 interactive media platform, whereas the acquisition of content and production of TV content is oriented on the Web service paradigma.

INTRODUCTION

New challenges and possibilities to provide a wide range of new services are given by Digital TV – might realized as a pure Internet application in case of IPTV and/or WebTV /Elsner 2008/ or as interactive set top based digital television. This implies also increased programming choices for users as well as the access for interactive video and further data services.

Digital programs broadcast, customization of the TV content as well as the increased demand for interactivity and mobility insist on developing new technologies for multimedia resp. television specific information delivery.

Meanwhile several international vendors provide digital broadcast streaming. Also the German providers Deutsche Telekom, Arcor and Alice (Hansenet) distribute via DSL broadband live streaming products. However the base taxes and fees are quite high and are comparable with cable TV fees. The streamings consist of MPEG2 streams, which are provided via set top boxes. Using the VLC player this content is also technologically accessible via PC – but officially the usage is not supported. The Telco

providers deploy this reception within a closed network (IPTV).

THE DESIGN OF THE MEDIA-PLATFORM

As depicted in Figure 1 the broadcast media screen is realized as a split screen window consisting of mainly 7 sub-screens. The main characteristic and main realization condition has been that each sub-screen is changing undependable from each other. This type of visualization requires either the application of a pure frame technique or the provision of portlet techniques /Doussier-2008/. The sub-screens are given as follows:

- Screen-Window 1 (SC 1): The main navigation window, for selection of Program, Semantic-Zoom, Communication (user specific actions), Marketplace, and Services
- Screen-Window 2 (SC 2): The main broadcast window, content depends on the chosen selection in Navigation in Screen 3
- Screen-Window 3 (SC 3): Navigation window for the main broadcast window
- Screen-Window 4 (SC 4): Gives the main title of the current broadcast resp. communication action
- Screen-Window 5 (SC 5): Gives the running broadcast as small window, the Zoom button shifts the stream to the main broadcast window, below the stream keywords are given, representing the current program
- Screen-Window 6 (SC 6): Window for information and communication activities selected by the current user (choice selecting the current program scheme, video selection, photo selection etc)

In the present state the screens are realized in conventional frame technique for demo purposes.



Figure 1: Start Screen of the Media-Platform

The click on the button ZOOM in SC 5 shifts the running stream to the main broadcast window as illustrated in Figure 2. In the screen window SC 5 the former stream is replaced by a news and information window, which gives access to news section, the as well as the forum and the chat section. Further screens are given in the appendix.



Figure 2: The main broadcast window – the change from small to full broadcast view

SEMANTICALLY REPRESENTATION AND ANNOTATION OF THE BROADCAST CONTENT

The semantically processing of multimedia content is a quite young activity and research topic – one of the first papers related to the use of Semantic Web technologies with respect to the handling of multimedia content is given by /Downman 2005/. The paper describes the Rich News annotation system, which semantically annotates television news broadcasts using websites as a resource to aid in the annotation process. The decision to extract the

semantically annotation data from web sites was due the poor quality of ASR (automatic speech recognition) of the audio track of the broadcasted stream. The authors furthermore pointed out that Rich News is essentially an application-independent annotation system applied in the first step to BBC news. In this work the first time the term of semantic television was used.

In the current media platform the annotation process is fulfilled by processing the redaction workflow data assigned to each AV object (reportage, documentation, clips etc.). The broadcast workflow is supported by a set of software tools, e.g. the program generation and handling, the processing of AV-Objects as well as as the semantically part. In Figure 3 the semantically parser is illustrated.

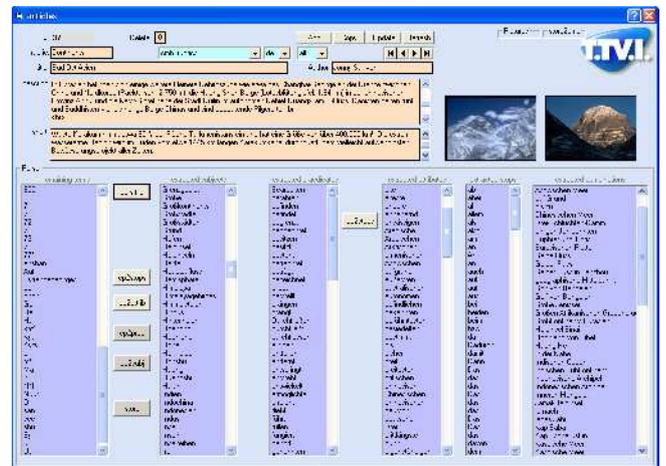


Figure 3: Comprehensive parsing and RDF oriented structuring of concepts of AV object content

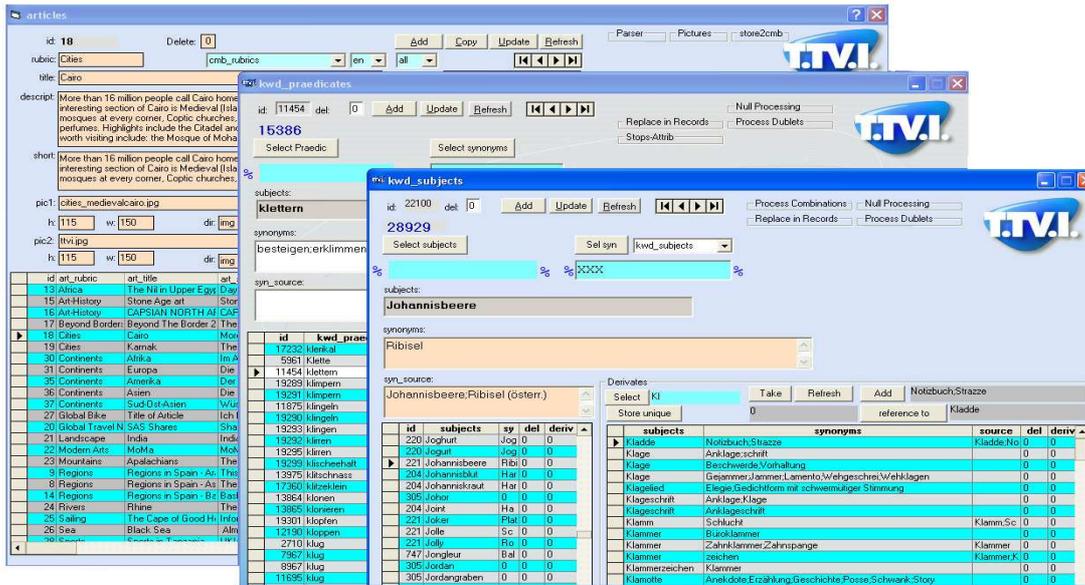


Figure 4: Tools for processing TV broadcast content and concepts

As depicted in Figure 4 several software tools are realized for processing the TV broadcast content and the semantically enrichment of the AV objects. The semantically processing is executed in two main steps:

- 1) the broadcast content as well as the edutainment products (given as textual descriptions) are RDF oriented processed using several flexible dictionaries; in the first step as classification and/ structure a three layered or categorization tree is used
- 2) after the annotation process the objects (AV-objects; edutainment products) are semantically assigned by a Fuzzy assignment procedure /Andonova-2006/

This assignment is one of the main features of the discussed media platform: as depicted in Figure 5 a

semantic annotation and assignment procedure determines the relation between broadcasted content and edutainment products. In real-time – during the broadcast stream - the corresponding edutainment products are nested by links and recommended to the user.

The main effect here is an edutainment supporting one: the running broadcast is supported and enriched by recommended objects reflecting background knowledge and initiate the user and consumer for further interaction related to the given broadcast content. However this kind of conceptual assignment is also useful for arbitrary objects – beyond the edutainment section and area.

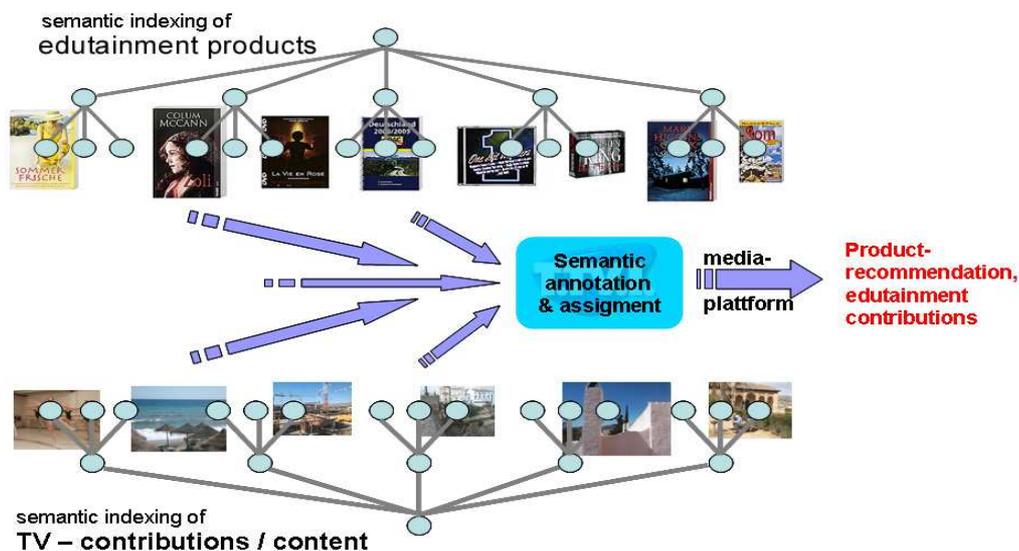


Figure 5: Semantically indexing of edutainment products and broadcast content and adequate assignment and recommendation

In this meaning the provided annotation and assignment algorithms and software tools are application independent in a double sense: the broadcast content as well as the edu-objects can be given in arbitrary manner.

EXPECTED RESULTS

The realization of the media platform has already been started. It is planned to apply the platform in the first run in the edutainment sector.

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APPENDIX (SCREENSHOTS)

