

FRAMEWORK APPROACH FOR SEARCH AND META-DATA HANDLING OF AV OBJECTS IN DIGITAL TV CYCLES

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ABSTRACT

The paper objective is to describe an approach for a software framework consisting of an application oriented tool set for enhanced search, retrieval and processing of audio-visual (AV) content objects. Using semantic web service technologies and watermarking techniques the framework is designed to cover several aspects of object and workflow handling. It allows optimized system integration to support workflow environments realized as P2P as well as open network and mobile service approaches.

INTRODUCTION

Existing approaches related to AV object search and retrieval is reduced to the application of conventional search engines, like Google, yahoo, Lycos, etc. (Henten Anders and Reza Tadayoni, 2005). Accordingly the degree of integration and encompassing features and characteristics is low. In the following an integration approach that combines existing tools and models as well as innovative attempts out of the area of resource discovering, watermarking and semantic web service based interoperability is discussed (Nern H Joachim, and T Atanasova, 2005)

The state of the Art in the Semantic Web area is mainly characterized by two streams:

The WSMO initiative aims to meet three goals: to describe the domain of Semantic Web Services, to define a conceptual model for a formal language design and to define an execution environment, which can enable the complete definition and execution of Web Services' interactions (Stollberg M., D. Roman, 2005, Fensel D, 2000)

OWL-S: According to the OWL-S ontology specification, a service can be defined through the use of core components the Service class is made of: the Service Profile, the Service Model, the Service Grounding and the Resource Ontology. Previous releases of OWL-S were

referred to as DAML-S and were built upon the DARPA Agent Markup Language and Ontology Inference Language, DAML+OIL (Ruben Lara et al, 2004).

The framework proposed in this paper is focused on the important aspect of integration. The described framework allows the integration of existing digital repositories so that the content can be made available to a semantically enriched digital environment. This encompasses both interactive content services and potentials for targeting advertisements at specific customers or customer target groups. Two main technologies are essential for the realisation of such framework:

- encryption based watermarking for unique and unambiguous identification as well as encrypted object description via embedded metadata;
- semantic annotation and knowledge formalization for optimized object descriptions as well as for ensuring a high degree of interoperability due to the application of semantic web services.

DIGITAL CONTENT DESCRIPTION

Business models on the basis of digital content require adequate representation of that content. Architecture, oriented to services, should allow a processing that content in heterogeneous digital application environments.

Description of AV objects has to provide expressive semantic descriptions of digital content, based on ontologies of information objects. Agents should be embedded into digital infrastructures implemented on advanced knowledge content carrier architecture.

SOFTWARE AND TECHNOLOGY FRAMEWORK

The proposed framework is intended to ensure searching, interpreting, navigating and retrieving audio-visual content objects. It consists of an application oriented software tool set for allowing optimized system integration to support workflow environments realized as P2P as well as open network approaches.