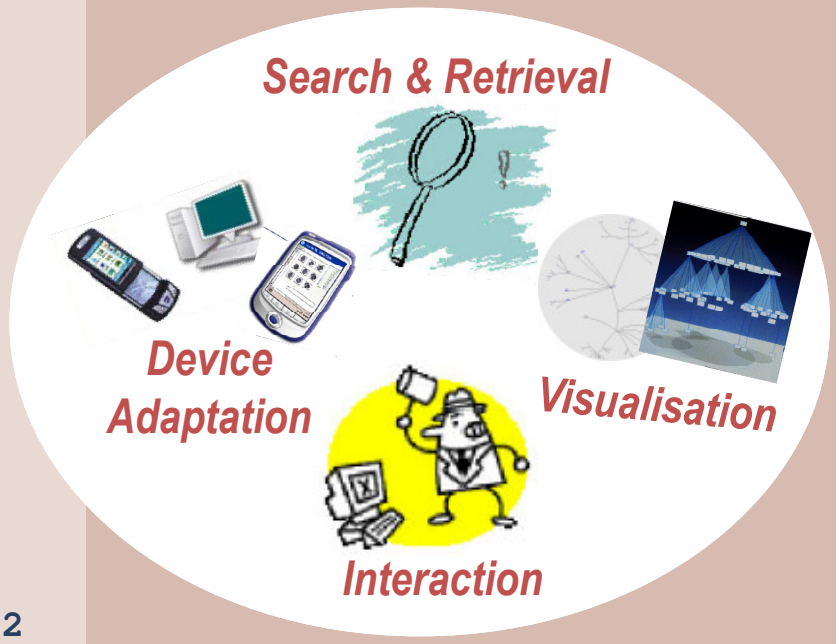
I-SEARCH

Newsletter

Issue 2

www.isearch-project.eu

January, 2011



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Welcome Note

Welcome to the second newsletter of the European project I-SEARCH. I-SEARCH is a Specific Targeted Research Project co-funded from the EU 7th Framework Programme and has started its activities since the 1st of January 2010.

In this issue you can take a glance at the early achievements and on the latest news of the project's activities. A variety of subjects are presented, including the I-SEARCH use cases and indicative scenarios, a rough overview of the I-SEARCH system architecture and an initial specification of the RUCoD format.

Please note that further information can be found on the project web site: http://www.isearch-project.eu

Publications

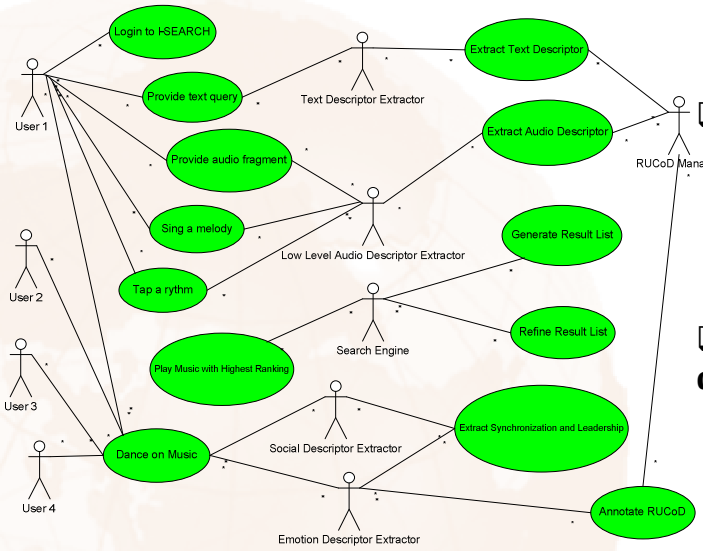
1. G. Varni, M. Mancini, G. Volpe, A. Camurri, "A System for Mobile Active Music Listening Based on Social Interaction and Embodiment", International Journal ACM Mobile Networks and Applications, July 18, 2011.
2. V. Darlagiannis, K. Moustakas and D. Tzovaras, On Geometric and Soft Shape Content-Based Search, ICIP 2010, Hong Kong, September 26-29, 2010.
3. A. Axenopoulos, P. Daras, D. Tzovaras, Towards the Creation of a Unified Framework for Multimodal Search and Retrieval, 2nd International ICST Conference on User Centric Media, Palma de Mallorca, September 1-3, 2010.
4. G. Grefenstette, P. Daras, E. Tzoannos, V. Croce, J. Etzold, V. Tountopoulos, A. Massari, S. Spiller, L. Franco Sutton, "User Centric Search over Multimodal and Multimedia Content", NEM SUMMIT 2010 Barcellona, October 14, 2010.
5. P. Daras, T. Semertzidis, L. Makris, M. G. Strintzis, "Similarity Content Search in Content Centric Networks", ACM Multimedia 2010, Firenze, Italy, October 2010.
6. A. Camurri, C. Canepa, P. Coletta, F. Cavallero, S. Ghisio, D. Glowinski, G. Volpe. "Active Experience of Audiovisual Cultural Content: the Virtual Binocular Interface", ACM Multimedia 2010, Firenze, Italy.
7. P. Daras, A. Axenopoulos, V. Darlagiannis, D. Tzovaras, X. Le Bourdon, L. Joyeux, A. Verroust-Blondet, V. Croce, T. Steiner, A. Massari, A. Camurri, S. Morin, A.D. Mezaour, L. Sutton and S. Spiller, "Introducing a Unified Framework for Content Object Description", Int. J. Multimedia Intelligence and Security, 2010, accepted for publication.
8. Thomas Steiner, "SemWebVid – Making Video A First Class Semantic Web Citizen And A First Class Web Bourgeois", ISWC2010, November 2010.
9. Thomas Steiner, "How Google is using Linked Data Today and Vision For Tomorrow", Future Internet Assembly, Linked Data in the Future Internet, Ghent, Belgium, December 1010.

Newsletter Outline:

I-SEARCH Use Cases

I-SEARCH performed a thorough analysis of the target user domains user requirements to conclude on the relevant use cases. Through the effective scripting of indicative scenarios, I-SEARCH made an attempt to the current and extend it to future practices, which can be enabled through the use of the I-SEARCH framework. These scenarios highlight the need for enhanced semantic content analysis and representation techniques and describe relevant tasks that should be followed by the end-users in the respective domains of music, furniture and games, aiming to efficiently perform search and retrieval activities.

In order to gain from the end-users' involvement in the development phase and deliver the I-SEARCH framework to be maximally accepted by the relevant stakeholders, the project team provided a control environment, through which the non technical oriented people were asked to express their views about the functional specifications of the envisaged system.



This was enabled through the compilation of the I-SEARCH questionnaire. The questionnaire results were analysed in order to transform the simple example usage scenarios into actual use cases.

These use cases reflect the needs of the end users for exploiting a multimedia search engine for search and retrieval of multimodal content in the music, the furniture and the 3D games development domains. The target of these use cases is as follows:

- In the **music domain**:
  - Retrieve appropriate music content using expressive embodied queries
  - Realising the collective DJ experience by enabling the selection of a piece of social music through gestures and user expressions from a group of people
- In the **furniture domain**:
  - Satisfy the user needs for accessing the most appropriate piece of furniture using multimodal content for queries
- In the **3D games development domain**:
  - Let a professional 3D games developer to identify 3D content for enhancing games' visualisation
  - Enable a gamer to replace a virtual game avatar in order to individuate his/her an online game experience

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The I-SEARCH Architecture

The I-SEARCH Architecture has been drawn in order to facilitate the provision of a novel unified framework for multimodal content indexing, search and retrieval. In that respect. I-SEARCH distinguishes between three main phases to accomplish the target workflow.

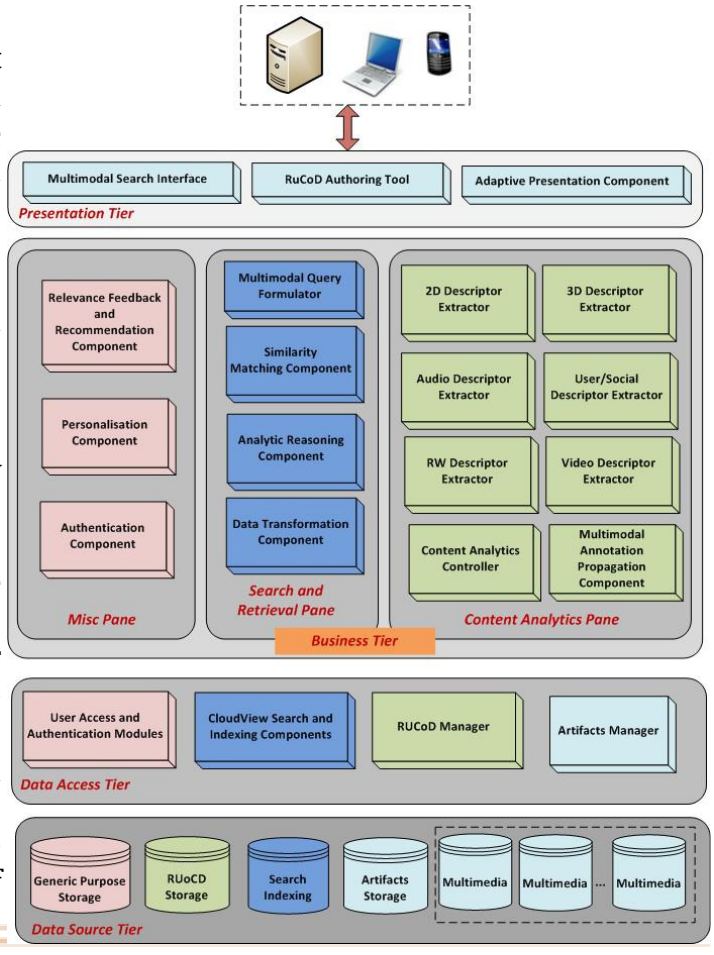
In the *Content Analytics Phase*, I-SEARCH targets to address the challenge of dealing with the different modalities of the multimedia items.

In the *Search and Retrieval Phase*, I-SEARCH exploits the well known Exalead Search Engine to facilitate access to multimodal multimedia content, based on the specific user needs and preferences, as they are expressed in the query process. The analysis of the user query follows a two-step approach; at a first step the query analysis is performed in terms of the modality of the query and a list relevant results is retrieved, through matching the query formulation with the RUCoD description of the annotated content. As a second step, I-SEARCH offers the possibility for the end user to refine the results list by providing feedback to the retrieved content through novel interaction mechanisms with it.

In the *Visualisation Phase*, I-SEARCH adopts visual analytics technologies to offer a new experience of the query results realisation to the end users.

In order to realise the foreseen functionalities, the I-SEARCH architecture is constructed on the following layers:

- The top layer consists of the User Interface Modules, along with the modules residing in the client side, directly providing support to the graphical representation of the user tools
- The Business Layer includes the components responsible for the 'logic' of the platform.
- The Data Access Layer contains all the modules, responsible to provide data access functionality to the upper level components . These objects encapsulate complexity of the data source models, offering a simplified façade to be used directly by the consumer components.
- The Data Source Layer contains all the Databases and Repositories which store data for the system in a distributed manner



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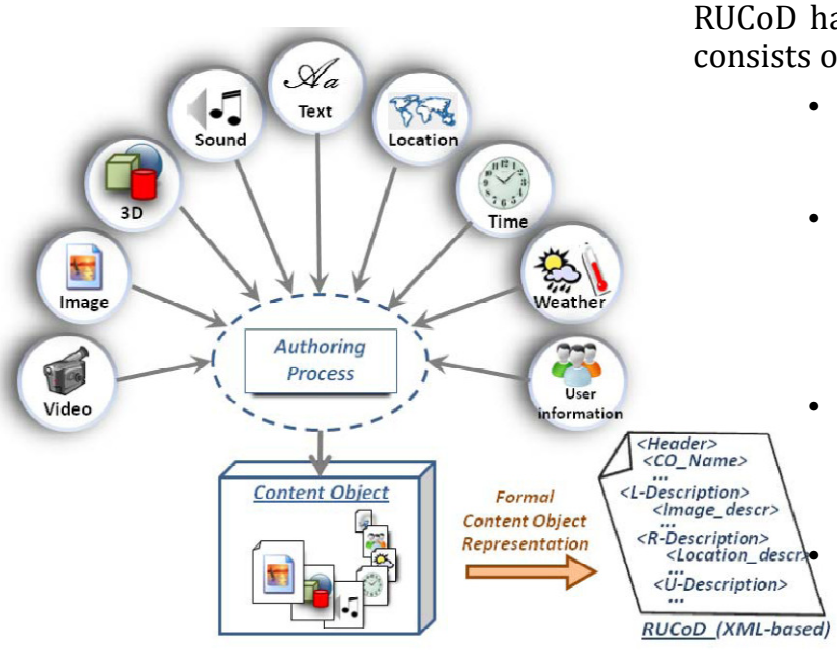
RUCoD Specification

A core part of the I-SEARCH project is the specification of a new Rich Unified Content Description (RUCoD). RUCoD will integrate: Intrinsic properties (low-level features) of the multimedia content, addressing several types of content (text, 2D image, sketch, video, 3D objects); non-verbal expressive and emotional descriptors; social descriptors.

In the context of I-SEARCH, a new rich media representation is introduced, namely the **Content Object**. A Content Object is:

"the representation of a specific instance of either a physical object or a physical entity or an abstraction , an event or a concept, which might have multiple views"

A CO can span from very simple media items (e.g. a single image or an audio file) to highly complex multimedia collections (e.g. a 3D object together with multiple 2D images and audio files) along with accompanying information. When a user refers to a CO, s/he directly refers to all of its constituting parts. All this information can be created, generated or captured by using a variety of hardware and software tools, input devices, sensors, etc.



RUCoD will serve as the formal representation of Content Objects, consisting of descriptions (features/characteristics) of various multimedia types that are somehow associated to each other.

RUCoD has a hierarchical structure and consists of the following parts:

- *Header*: includes general information (type, name, ID, creation)
- *L-Descriptors*: low-level descriptors, extracted from each separate media (3D, images, sounds, videos, text)
- *R-Descriptors*: descriptors extracted from real-world sensors (time, weather, location, etc)
- *U-Descriptors*: descriptors related to user behaviour (emotions, expressions)

Newsletter Outline:

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Project Data Sheet

Acronym	: I-SEARCH
Full Name	: A unIfied framework for multimodal content SEARCH
URL	: http://www.isearch-project.eu
Programme	: FP7-ICT-2009-4
Strategic Objective	: ICT-2009.1.5: Networked Media and 3D Internet
Start Date	: 1 January 2010
Duration	: 36 Months

The 3rd issue of the I-SEARCH Newsletter will be released on July 2011 presenting the progress of the project for the period since the 2nd issue.