Personal Navigation in the World of News

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***Abstract*— This is a brief description of MESH - Multimedia semantic syndication for enhanced news services (http://www.mesh-ip.eu), an EC co-funded project that started in March 2006 to create a framework for intelligent creation and delivery of semantically-enhanced multimedia news.**

***Index Terms*— MESH, multimedia, syndication, knowledge, personalisation**

I. Introduction and Rationale

In our days we are confronted with vast amounts of information commonly referred to as "news". News about all aspects of our everyday lives are nowadays accessible in all corners of the world. But how easy is it for anyone to navigate in this flood of information, and what opportunities are there to get an objective view of controversial events, at national or international level?

Was the latest war an invasion or a liberation?
Were the latest elections a grand victory
or the result of an unfair election system?

Our era of knowledge should provide for methods of understanding the meaning of 'news'. Contemporary methods should organise news in a semantic way that allows the reader to have a complete overview of all similar and conflicting views. They should furthermore provide for the filtering of information according to personal preferences and interests.

II. MESH Target Users

Within the MESH vision three categories of potential users have been identified:

Personal user: An individual everyday news consumer who may belong to any profession or business and wishes to use the MESH platform to have access to everyday breaking or archived news in an easy and effective way.

Professional user: A professional who works in the area of media and would like to use the MESH platform to make his/her work easier and more effective. This category may include journalists, photographers, reporters or any other employee in the media sector.

Business user: A professional associated to the world of media, interested in building a business using the MESH platform. This business will relate to models of electronic news services as a focused news agency or a thematic portal which will make use of MESH technologies to provide intelligent content services.

III. MESH news in 2010 - A scenario

MESH has tried to describe the expected future usage and consumption of news with some storyline scenarios. One of these scenarios - which has been visualised in a Flash application (to view it go to http://www.mesh-ip.eu) - portrays the life of Ilias Bonn, a freelance business and economics journalist and consultant travelling back and forth between Thessaloniki in Greece and Cologne in Germany.

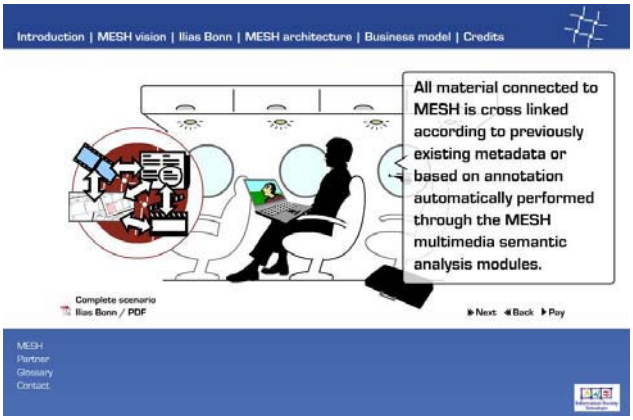

Fig. 1. Ilias Bonn scenario as a flash animation

At the European CEDEFOP Institute (European Institute for the Advancement of Professional Skills) Ilias Bonn is working as a reviewer and external advisor. However, in the past the physical distance has often kept him from working for CEDEFOP. This has all changed, thanks to advancements in technology, and thanks to MESH! It is vital for Ilias Bonn's professional life to have access to news content in various formats coming from various sources, anywhere and at any time, using both stationary and portable end devices. MESH is to provide for most of the needs of Ilias Bonn as his interests have been formed by tracking his usage of content and services, and the system assumes and makes suggestions as to how Ilias can be kept up to date with the material that is useful to him.

Time spent in planes is ideally suited to view video content, as this is much easier done than reading or typing. Ever since MESH has become fully in line (synchronised) with Ilias

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Bonn's profile, even short journeys are ideal for effective video searches as MESH automatically refines search results to clips which could be interesting to Ilias for watching or reusing in his articles. Requesting licences for the material is dealt with automatically by the MESH platform. New licence requests only occur when new sources are accessed and used, or when content is accessed on a basis different to usage models that are in operation already between Ilias and the various content suppliers he uses. The "content auctions" which Ilias conducts for international re-use of his copyrighted material generate further income for him. Through semantic analysis MESH understands the content of Ilias' submitted material and suggests purchasing to specific MESH users according to their preferences as described in their profiles.

Every three hours MESH provides Ilias with a personalised summary of Greek news including textual articles, videos and images from several sources. Pictures and video material from the early days of the Internet and streaming media are available free of charge from German providers, whereas several billing models are available for high quality video, depending on its popularity. The MESH system / architecture "knows" what it is doing as the score of its users regarding individual content items are put into correlation with each other, providing content suppliers with valuable information about quality and quantity of the content that is being offered.

Every time new and related material is added, this is referenced, linked and associated with existing content. This process can be based on available metadata or on the automatic extraction of meaning, done by individual MESH tools and components. Apart from using various automatic annotation mechanisms, Ilias is still also using a manual annotation tool for tagging his work according to his personal judgement or for checking on the automatic annotation provided by MESH. The video search function also provides quick and quite reliable results as both real-time and off-line analysis are used for the recognition of content based on the understanding of images, speech and text. Even older material is always taken into consideration with every query, either because the personal agent has "learned" from past experiences or because other MESH users have fine-tuned and further improved existing data.

MESH has become a vital part in the life of Ilias Bonn. He can no longer imagine life without MESH!

IV. MESH Problem Statement

What advances are still needed to push the previous vision from fiction to reality?

- **news have to be understood** by fully or semi-automatic mechanisms. This means that a news item (in any multimedia form; text, image or video) has to be analysed and categorised (i.e. annotated) according to its contents.
- **news consumers also have to be understood**. This involves the profiling of individuals in a structured manner and constantly updating these profiles through personally provided preferences, but also through automatic understanding of their needs and interests by monitoring their requests and habits.
- **news items will then have to be matched** to the readers' interests and requests by reasoning what news would be preferred by which reader and in which way.
- **news have to be delivered in an effective way.** Personalised multimedia summaries can be a basic means of navigation into the full set of information, while items referring to the same subject will have to be shown in parallel to make critical reviews possible.
- **the source of information will also have to be understood** and profiled if the reader is to be assisted in forming an objective view of actual events. Structured information will have to be provided about the source helping the reader to understand whether the news provided could be biased and, if this is likely to be the case, towards which side. Credibility will also have to be measured in such a way.
- in our times, **mobility** is a significant aspect to be taken into account. With mobile devices being used more and more both for the production and consumption of news, special technologies need to be advanced into a framework that allows effective inclusion of mobile "prosumers".

V. MESH Technology

In order to fulfil the objectives mentioned, a number of technologies are being developed and integrated into the MESH system:

- ***Multimodal analysis, reasoning and annotation*:** semantic concepts within the context of application domains will be extracted based on knowledge-assisted multimodal analysis and annotation using a multimedia ontology infrastructure.
- ***Summarisation***: advances in both semantic summarisation (using the generated knowledge) and real-time summarisation will be pursued.
- ***Personalisation***: innovative methods for achieving granular personalisation suitable for use in resource-constrained environments will be developed.
- ***Multimedia content adaptation*** will cover the selection of optimal adaptation parameters and different adaptation modalities (transcoding, transmoding, scalable content).
- ***Reasoning for syndication and access*** will handle semantic comparison and the combination of meaning extracted from various multimedia sources.

VI. Conclusion

The MESH project was initiated with the vision to integrate semantic technologies into a setting that will bring the world of news closer to knowledge-enabled services. Twelve different organisations from seven EU countries with expertise in all these diverse fields have joined forces to make ***personal navigation in the world of news*** a reality.