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Title:	**Report of the AHG on MPEG-7 Semantics DS**
Source:	**AHG on MPEG-7 Semantics DS**
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Status:	**AHG Report**

1   Semantics DS AHG Mandates (from N2980 [1])

1. To draw examples of applications for which a semantic based approach is adequate for descriptions of the content, outlining the design process of the different semantic components and interactions.

2. To investigate ways to organize semantic information

3. To extend the current event/object DS and event/object relation graph

4. To propose a revised syntax for the current semantic DS

5. To review with Generic AV DS AHG N976 the type of semantic information to be included in the syntactic DS of the MPEG-7 Generic AV DS.

2   Summary of AHG Activity

This AHG has been created at the last MPEG meeting in Melbourne to solve the problem of identifying whether semantic description should be separated from the structure description, and to enrich the elements of the Semantic DS. Following the discussions on the email reflector, and on the AHG meeting Dec. 5th, 1999, in Maui, new desirable functionalities for the Semantic DS have been proposed. Further to revise the Semantic DS syntax that would enable such new functionalities to be incorporated, it clearly appears that it should be possible to instantiate only the Semantic DS without having to rely on an often obtained a priori structural decomposition.

3   Results of Individual Mandates

The results of the work on the individual mandates are as follows:

3.1   Mandate 1

- **To draw examples of applications for which a semantic based approach is adequate for descriptions of the content, outlining the design process of the different semantic components and interactions.**

Result: The investigation resulted in the identification of a series of applications for which a semantic description is clearly the one seeked, so that a top-down approach (semantically driven) approach was the most adequate. Examples of such applications are
1. Consumer video index
2. Consumer image index
3. Road Traffic surveillance index
4. Broadcast programme description for archiving purposes.

These examples were drawn through direct interactions with industry in the field. People close to applications suggested that the most relevant information is of semantic type rather than structure related.

Recommendation: Continue to identify more application examples, with possibly clear indication of the design and implementation process. Use some of these as potential platforms for implementation to enhance the definition of the Semantic DS and demonstrate its validity.

3.2   Mandate 2

- **To investigate ways to organize semantic information**

Results:
1. Current solution is that semantic information is attached to the structure DS, directly or via the syntactic-semantic link (through event, object, event/object relational graph, and annotations). It is felt that there is a need for a stand alone instantiation of semantic DS

as an index to information and D's, without having to necessarily refer to a structure DS, which may in no way correspond (if generated in an automatic fashion), to a useful organization of the data from a semantic point of view.

2. In terms of the elements of the semantic DS, the focus has been placed on the object DS (that typically relates to elements of the data well defined in space), the event DS (that typically relates to elements of the data well defined in time), and their mutual and self-relationships. Little emphasis has been given to the ability to manipulate abstract entities (concept DS), and create organized hierarchies and relationships between such entities, and the event and object DS's. It appears that the Semantic DS should clarify the existing "abstract" object DS, and extend it so as to support all possible abstract entities of the semantic DS.

Recommendation: Continue the discussion including relevant contributions to Maui meeting and make specific recommendations to extend the Semantic DS by Wednesday..

3.3   Mandate 3: To extend the current event/object DS and event/object relation graph

Result: Introduce a specialized hierarchical DS to enable the description of abstract concepts which cannot be well represented thanks to the object and event DS's or their relationships (consider also removing for clarity the "abstract object DS" category or alternatively review its definition). Consider the possibility to attach weights or order information [2] to this DS.
In addition to the syntactic-semantic link, allow at each level of the Semantic DS the possibility to have media locators, and direct references to DS's (in particular DS's related to time, motion, texture, color…). Enable also linking to elements of "high level" DS's such as MedMet DS, Model DS…

Recommendation: Continue the discussion including relevant proposals to Maui meeting and make specific recommendations to extend the Semantic DS by Wednesday.

3.4   Mandate 4 To propose a revised syntax for the current semantic DS

Result: Related activities have been delayed as it was felt that a convergence of ideas and results should be achieved for Mandates 2 and 3, before this discussion could adequately take place

Recommendation: Start the work in conjunction DDL AHG at Maui meeting.

3.5 Mandate 5: To review with Generic AV DS AHG N2976 the type of semantic information to be included in the syntactic DS of the MPEG-7 Generic AV DS.

Result: As some specific applications may rely fundamentally on the description provided by the structure DS, and as limited semantic information is currently available in the structure DS, it is more efficient to have extended semantics directly included in the structure DS.

Recommendation: Revise the structure DS syntax, to include enriched semantics information at the segment level.

4   References

[1]   Ad Hoc Group on MPEG-7 Semantics, *ISO/IEC JTC1/SC29/WG11 MPEG99/N2980*, Melbourne, Vic, October 1999.

[2]   MPEG-7 Requirements Document (V.10), *ISO/IEC JTC1/SC29/WG11/N2996*, MPEG99, Melbourne, Vic, October 1999.