Synchronized Multimedia

SMIL (TM) To enable simple authoring of TV-like multimedia presentations such as training courses on the Web, W3C has designed the Synchronized Multimedia Integration Language (SMIL, pronounced "smile"). The SMIL language is an easy-to-learn HTML-like language. Thus, SMIL presentations can be written using a simple text-editor. A SMIL presentation can be composed of streaming audio, streaming video, images, text or any other media type.

For a more detailed description of the goals of the SMIL language, see the W3C Activity Statement on Synchronized Multimedia; a regularly updated report to W3C members that is also available to the public.

Work on Synchronized Multimedia is being managed as part of W3C's User Interface Domain.

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Introduction W3C's Synchronized Multimedia Activity has focused on the design of a new language for choreographing multimedia presentations where audio, video, text and graphics are combined in real-time. The language, the Synchronized Multimedia Integration Language (SMIL) is written as an XML application and is currently a W3C Recommendation. Simply put, it enables authors to specify what should be presented when, enabling them to control the precise time that a sentence is spoken and make it coincide with the display of a given image appearing on the screen.

Concepts – **sequential and parallel timing** The basic idea is to name media components for text, images, audio and video with URLs and to schedule their presentation either in parallel or in sequence.

SMIL presentation characteristics

- The presentation is composed from several components that are accessible via URL's, e.g. files stored on a Web server.
- The components have different media types, such as audio, video, image or text. The begin and end times of different components are specified relative to events in other media components. For example, in a slide show, a particular slide is displayed when the narrator in the audio starts talking about it.

- Familiar looking control buttons such as stop, fast-forward and rewind allow the user to interrupt the presentation and to move forwards or backwards to another point in the presentation.
- Additional functions are "random access", i.e. the presentation can be started anywhere, and "slow motion", i.e. the presentation is played slower than at its original speed.
- The user can follow hyperlinks embedded in the presentation.

The SMIL language has been designed so that it is easy to author simple presentations with a text editor. The key to success for HTML was that attractive hypertext content could be created without requiring a sophisticated authoring tool. The SMIL language achieves the same goal for synchronized hypermedia.

Example applications

- Photos taken with a digital camera can be coordinated with a commentary
- Training courses can be devised integrating voice and images.
- A Web site showing the items for sale, might show photos of the product range in turn on the screen, coupled with a voice talking about each as it appears.
- Slide presentations on the Web written in HTML might be timed so that bullet points come up in sequence at specified time intervals, changing color as they become the focus of attention.
- On-screen controls might be used to stop and start music.

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<par¿
<a href="#Story"¿ <img src="button1.jpg"/¿ </a;
<a href="#Weather"¿ <img src="button2.jpg"/¿</a;
<a href="#Weather"¿ <img src="button2.jpg"/¿</a;
<excl;
<a href="story" begin="0s";
<a href="story" begin="os";
<a href="story" begin="story" begin",">story" begin="os";
<a href="story" begin="os";
<a href="story" begin="story" begin",">story" begin="story" begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","begin","
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This example demonstrates the use of two tags PAR (parallel) and EXCL (exclusive). The EXCL element has been introduced in the SMIL 2.0 draft. In the example, two images are shown as buttons. When the user clicks on one of the buttons, only then is the selection played. If the user selects "Story" then selects "Weather", "Story" is stopped and "Weather" is played. The jexcl_i tag is used to make it possible to select one (but not both) at a time. Notice the use of the <par_i tag to schedule captions for the story in parallel to the video, and a spoken weather report in parallel to the picture of the weather.

The SMIL 2.0 Working Draft proposes XML tags for controlling presentation of multimedia components in sequence, in parallel and also on an "exclusive" basis (as in the example above). The draft also defines a number of elements and attributes useful for controlling presentation, synchronization, and interactivity.

History Experience from both the CD-ROM community and from the Web multimedia community suggested that it would be beneficial to adopt a declarative format for expressing media synchronization on the Web as an alternative and complementary approach to scripting languages. Following a workshop in October 1996, W3C established a first working group on synchronized multimedia in March 1997. This group focused on the design of a declarative language and the work gave rise to SMIL 1.0 becoming a W3C Recommendation in June 1998.

Availability You can watch a SMIL presentation by downloading a SMIL "player" on your PC. A list of SMIL players is available from the Synchronized Multimedia Home Page.

Synchronized Multimedia Working Group Mission Statement The mission of the SYMM working group is to continue W3C's work on synchronized multimedia that started with SMIL 1.0. The goal is to extend the development of SMIL as a declarative, XML-based timing and synchronization language, and advance the corresponding timing model.

Design goals

SMIL 2.0

• Extend the functionality contained in SMIL 1.0. Using SMIL2.0, an author can describe the temporal behavior of a multimedia presentation, associate hyperlinks with media objects, describe the layout of the presentation on a screen, and specify interactivity in multimedia presentations.

SMIL 2.0

Modules

- The Animation Modules
- The Content Control Modules
- The Layout Modules

- The Linking Modules
- The Media Object Modules
- The Metainformation Module
- The Structure Module
- The Timing and Synchronization Module
- The Time Manipulations Module
- The Transition Effects Module

SMIL 2.0 Allow module-based reuse of SMIL syntax and semantics in other XML-based languages, in particular those that need to represent timing and synchronization. For example:

- SMIL modules could be used to provide lightweight multimedia functionality on mobile phones, and to integrate timing into profiles such as the WAP forum's WML language, or XHTML Basic.
- SMIL timing, content control, and media objects could be used to coordinate broadcast and Web content in an enhanced-TV application.
- SMIL Animation is being used to integrate animation into W3C's Scalable Vector Graphics language (SVG).
- Several SMIL modules are being considered as part of a textual representation for MPEG4.

SMIL 2.0 etcetera

- Define a set of language profiles that incorporate the SMIL 2.0 modules. The working group intends to define an enhanced version of the SMIL language, as well as an integration of SMIL with XHTML.
- Extend and improve the accessibility features of SMIL 1.0. SMIL 2.0 will allow authors to include closed audio descriptions as well as closed captions in their SMIL presentations.

The SYMM Working Group plans to achieve W3C Proposed Recommendation Status for SMIL 2.0 in May 2001, and W3C Recommendation status end of June 2001.

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