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Abstract (for dissemination)	This Milestone reviews the different approaches to content creation that have been used in the course of the eSign project. It describes Tools that have been used to produce content for websites and other applications and how third parties such as web authors and designers have been involved. From this it is possible to define a more general set of workflow requirements for a Content Management System (CMS) for signed content creation. It takes into account the constraints which different content styles make, and considers signed content in the context of the multilingual translation techniques, highlighting the differences particular to sign languages.

1 Executive Summary

1.1 Content Management Systems

Content developed using eSIGN tools will become out of date quickly unless working practices keep signed content updated in line with changes to text pages. It was anticipated that maintainers of these websites would already be using content management systems.

A survey has been made to understand current practice of eSIGN partners in order to develop processes that would make it straightforward to keep signed content up to date.

1.2 Content Styles

All web pages including eSIGN content will need to include scripting to launch the avatar or link to a window or pane already containing the avatar. Scripts will send SiGML data to the avatar at the appropriate time, often in response to requests from users via buttons or hyperlinks.

Some pages are translations of pages with free-form information and provide signed versions of some or all of the textual material.

Where signing support is added to web forms, the approach is to provide signed help and explanation to assist deaf people in completing forms.

For pages that present structured information on related topics, as in the job vacancies listings on the Viataal site, content is generated using an application of the SCGT.

1.3 Creating Content for Deaf Users

Since signed material produced using eSIGN tools appears as conventional XML text in SiGML, many aspects of content creation are the same whether the output is for hearing or deaf people. The report discusses special techniques required to design sites that present content adapted to the needs of deaf people and accommodate the avatar used to display signing.

2 A Survey of Existing CMS and Web Development Processes

2.1 Introduction

It is likely that eSIGN Content will become out of date quickly unless working practices keep signed content updated in line with changes to text pages. It was anticipated that maintainers of these websites would already be using content management systems. It was considered important to understand current practice of eSIGN partners in order to develop processes that would make it straightforward to keep signed content up to date.

2.2 Content Management for the German Portal

Systematics Integrations use a number of content management systems.

Vignette (http://www.vignette.com) provides a core Content Management application which can be linked to business processes. The Process Workflow Modeler provides a GUI interface for defining workflow that can be linked to the content management application.

CoreMedia (http://www.coremedia.com/) Smart Content Technology enables content to target a number of output platforms: Web, PDAs, WAP, etc. It has multilingual support and addresses WAI guidelines. A range of editing clients is available, principally web-based, using WYSIWYG editing. It is also possible to import content in a number of formats including XML. Tools exist for defining flexible workflows, with a workflow modeller.

2.3 Content Management on British Sites

The example BSL sites are being developed without using content management systems, although pages are delivered using technologies such as ASP.

2.4 The Viataal approach

Viataal's website is being created and maintained through a Content Management System developed to meet their needs. Content for the pages is stored in a database and the pages are built dynamically when a visitor requests a particular page.

Currently the CMS enables the user to build webpages with text, images, download links, and hyperlinks. The CMS-tool provides a simple interface to upload image files or the files offered for download.

3 Content Styles

3.1 Introduction

All web pages including eSIGN content will need to include scripting to launch the avatar or link to a window or pane already containing the avatar. Scripts will send SiGML data to the avatar at the appropriate time, often in response to requests from users via buttons or hyperlinks.

The page design must allow for the avatar to be embedded or for the text and image content to be visible alongside the avatar. This may require some reorganisation and may require content with signing to be presented over several pages where a single page sufficed for plain content. The issues are similar to those of presenting information for different target devices such as PDAs and WAP phones. Since advanced CMSs already address these issues, accommodating signing presents relatively few new issues.

Once the design has been decided, maintaining content is fairly straightforward since SiGML data is in XML format. Hence it can be treated as marked-up text by a CMS as for (X)HTML. Scripts can also be written so that the SiGML content is in a separate file accessed via a URL.

3.2 Free form text

To modify standard text on web pages for signed translation, the main requirement is to add some form of link that will trigger signing for a particular section. eSign partners have used both small icons, and hyperlinking the text itself as solutions.

Sections should be relatively small; signing a complete page of continuous text as a single block would be inappropriate as it would not allow deaf users the same freedom to read short sections and skip sections, in the same way that other readers of the page might do.

Sign language translators also need to consider if an exact translation is most useful, or whether shorter summaries, or more expansive descriptions would be more helpful. This would differ according to the context.

Content will generally be prepared using the eSIGN Editor and entered into static pages or a CMS that will generate pages dynamically.

3.3 Forms

Most web pages which have form-filling content are either self-explanatory, or have some guidance to aid completion. For deaf people, a signed translation of such guidance may be sufficient, or additional explanation may be necessary. Advice from deaf people and other sign language experts on such matters is encouraged. These matters aside though, content style for forms is essentially the same as that used for free form text.

Since the additional signing to be provided with forms is in free form, the eSIGN Editor will be the appropriate tool for generating SiGML sequences.

3.4 Structured content

Creating structured content is a familiar application of a CMS. Pages are dynamically generated based on database contents so structured content requires that the database is populated in an appropriate fashion.

Applications built using the SCGT generally use a template that produces a complete web page. For use with a CMS it will be more appropriate to generate information that can be transferred to the CMS database.

There is no reason why content created using the SCGT could not be extended to create output pages for hearing people as well as sign language versions. The CMS could use the information to generate pages in any number of languages on demand.

An SCGT application uses signing phrases and text that make up a complete model of the domain to be covered by the application. The signed phrases will be prepared using the eSIGN Editor but generation of the final content does not require the user to have any knowledge of signing.

4 Content Creation for Deaf Users

4.1 Introduction

Since signed material produced using eSIGN tools appears as conventional XML text in SiGML, many aspects of content creation are the same whether the output is for hearing or deaf people. However, special techniques are required to design sites that

present content adapted to the needs of deaf people and to accommodate the avatar used to display signing.

4.2 Handling multilingual content

Translation of web page content for deaf users raises many of the same issues as translation for any other *spoken* language. A translation must be prepared, and then applied to existing page structures in some way. When a page is edited, the maintenance process ensures that it triggers the re-translation of corresponding pages in other languages.

4.3 The particular challenges of sign language content

Obviously the major difference to web page modification where a sign language translation is required is the inclusion of avatar somewhere on the page. The avatar is relatively slow to load, and consequently, once present, it is desirable that it stays loaded to sign further text as required. This meant that all three partners adopted some version of a Frames format to allow it to remain while a user navigated though the pages of a website. Existing pages had to be modified accordingly. Two principal solutions are being adopted by eSIGN partners:

- The avatar is included as a frame, taking up to a third of the space previously occupied by a web page.
- The avatar is displayed in a small floating modeless dialog box (itself in fact a frame) which can be moved around by the user to facilitate viewing of web pages beneath.

If the chosen format is to use the floating modeless dialog box, then modification to the existing web page will be minimal, requiring only the addition of small icons or hyperlinks to trigger signing. However, adding the avatar to the web page itself will require considerable restructuring of the original page. Where there are a large number of graphics or photographs on a page, the difficulties could even make alteration infeasible.

To cater for various screen resolutions, many web designers now choose to build pages to fill the screen at a resolution of 800x600 pixels. Viewed at higher resolutions this results in a considerable amount of blank space around the page content. Taking advantage of this space, leaving the existing page as it was and encouraging viewing at a higher resolution, could be one solution where restructuring of pages is a problem.

4.4 Linking the Editor to Content Management Systems

Displaying signed content should present no difficulties for a CMS. As emphasised above, SiGML is just marked-up text and can therefore be stored in the CMS database in the same way as other XML-based data such as XHTML. The templates and stylesheets used for displaying signed text will be more sophisticated as they must include scripting for loading and interacting with the avatar. Nevertheless, the principles are no different from those needed for rich multimedia content.

It may be more difficult to link the CMS to the tools used to produce signed content (the eSIGN Editor and SCGT applications). In particular there will be special skills needed to use the eSIGN editor and it may be usual for specialist bureaux to generate such content. Hence the workflow for a CMS may need to support the export and import of signed documents that are edited off site.