What Is...

IMS Accessibility for Learner Information Package?

by Sharon Perry

In Brief

What is Accessibility for LIP?

The IMS AccLIP Specification provides **a means of describing preferences** so that learners can interact with an e-learning system regardless of disability, hardware or environment. These preferences are based on those parts of a computer system (hardware and software) that can be adjusted to improve accessibility, rather than on type of disability. It concentrates on the display, control and selection of learning content, so that learners with alternative content or interface requirements can be supported.

The name of the specification's root element - accessForAll - shows that it goes beyond just addressing preferences for learners with disabilities to ensure that all learners can define their preferences. For example, those learners with a hearing impairment, those without a soundcard, or those studying in a library may all have similar requirements, perhaps preferring captions instead of an audio track. It also allows learners to specify different sets of preferences (contexts) for different situations.

Some preferences can be listed hierarchically. For example, one type of assistive technology can be specified alongside optional alternatives if the preferred choice is not available - a learner might prefer to use the JAWS screen reader, but will optionally use the WindowEyes screen reader, if JAWS is not available.

What is AccLIP for?

Implementing the ACCLIP Specification ensures that **learners can control how they interact** with e-learning resources, regardless of the computer interface or environment around them. It also enables e-learning systems to locate and present resources appropriate to the learner's needs, such as captions or audio descriptions for video. The ability to modify the display, control and content is useful for many different types of learners, such as those:

• With disabilities;

• With low-bandwidth;

• Using mobile devices, such as PDAs (Personal Digital Assistants), 'phones, handheld computers, etc;

• With older or slower hardware;

• Without or unable to use certain pieces of hardware (e.g. speakers, soundcard, mouse, keyboard, etc);

• In noisy environments (such as a mine) or quiet environments (such as a library).
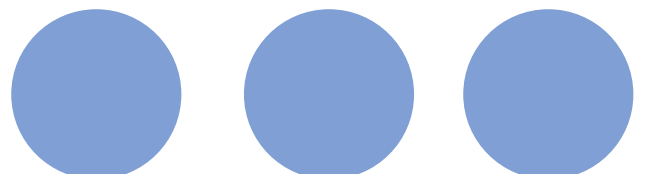
Technical Details

How AccLIP works

The ACCLIP Specification defines the *accessForAll* root element. This element contains the *context* element, which itself contains the three elements that represent learner preferences – *display*, *control* and *content*. The *accommodation* element describes what a learner may use in a test situation.

Context is the top set of elements, under the *accessForAll* root, and contains the elements which describe a learner's preferences: *display*, *control* and *content*. Different contexts can be created, which define **different sets of preferences for different situations**, depending on, for example, the time of day, study environment or hardware environment. The first context is always considered the default.

The *display* element has a number of sub-elements that define **how the interface and content should be presented** to the learner. It covers:

- Speech synthesizers (e.g. screen readers) and screen enhancement (e.g. screen magnifiers);
- Text highlighting;
- Braille displays and tactile displays;
- Visual alternatives to audio alerts; and
- Content structure settings (e.g. how windows should be displayed).

The sub-elements under *control* define **how the learner interacts with the technology**. It covers:

- Accessibility enhancements for a standard keyboard, virtual (onscreen) keyboards, and alternative keyboards;
- Mouse emulators (e.g. non-pointing devices) and alternative pointing devices;
- Voice recognition settings for spoken commands and dictation;
- Coded input (control methods that use a code to select the desired input);
- Prediction (e.g. word prediction); and
- Navigation through the content (e.g. use of a table of contents for navigation).

The content sub-elements, which could be paired with metadata to facilitate searches for content with accessibility support, define the **auxiliary, alternative or equivalent content requirements**, such as:

- Alternatives to visual content (e.g. audio descriptions, colour avoidance);
- Alternatives to text (e.g. graphics or sign language);
- Alternatives to audio content (e.g. captions or sign language);
- A learner scaffold (place to carry common tools, such as a dictionary, calculator, spell checker etc);
- Links to personal style sheets; and
- Requests for extra time

The *accommodation* element has a number of sub-elements, which specify the **preferences a learner is allowed when interacting with particular learning objects**, such as tests, to ensure that these preferences do not stop the learning object from fulfilling its intended purpose; for example, allowing the use of a spell checker during a spelling test. This element includes:

- Description of the learning object (e.g. test);
- The learner's request for the accommodation;
- The actual accommodations that are allowed;
- Who authorized the accommodation;
- When it was authorized and when it expires.

These accommodations are generally approved in advance of a test and any number of accommodation element sets can be defined.

Requirements

In order to present content according to the learner's preferences, the learner must first specify those preferences. Therefore, an **interface** needs to be developed to anonymously collect and store those preferences. A possible interface could take the form of a wizard or interactive form, which takes the learner through preference choices. Learners should also be able to change their preferences on-the-fly, with an option to save them at the time of change or at the end of the session. It is recommended that a learner's preferences are not associated with their identity, although some form of authentication may be required.

The **architecture** of the ACCLIP implementation also needs to be designed. The ACCLIP Specification does not specify an architecture, as it simply defines accessibility preferences, which could be included as part of a learner profile. However, as a possible example, an ACCLIP Manager could be designed as part of a larger Learner Profile Manager. Although ACCLIP preferences can be implemented and used in isolation, both an ACCLIP **repository** (for creating, storing and managing ACCLIP data) and an ACCLIP **application** (allows the relevant parts of the computer system to interact with the preferences file and present the content as the learner has specified) are required.

Related specifications

The ACCLIP Specification is part of the **IMS LIP (Learner Information Package) Specification**, which enables information about a learner's history, goals, and accomplishments to be recorded and managed. Other relevant specifications include:

- *Access For All Metadata Specification* - defines the meta-data that can be used to describe a learning resource's accessibility and its ability to match a learner's preferences.
- *Content Packaging Specification* - for identifying and accessing alternative forms of content. Accessibility preferences should be packaged in a Content Package.
- *Learning Design Specification* - selection of alternative content and sequencing may impact on the actual learning design.
- *QTI (Question and Test Interoperability) Specification* - accessibility preferences may affect how assessments are delivered.
- *Simple Sequencing Specification* - describes how content can be sequenced. The selection of alternative content may have an effect on the sequencing of learning activities.

ACCLIP does not define how the content presented to the learner should be designed or sequenced. However, it is assumed that that it complies with the W3C WCAG (World Wide Web Consortium Web Content Accessibility Guidelines).

Implementations

The Web-4-All Project enables users of public access internet terminals in Canada to define their preferences so that they can use any public access terminal without having to set up each individually. A wizard guides users through the initial configuration process. Users then need only insert their smartcard into the public access terminal in order for their preferences to be displayed.

See: http://www.web4all.ca/

The BarrierFree Project has created media-rich learning content that transforms content in response to the needs of the learner. Tools were developed, including authoring tools, a player/browser, a preference wizard, and a dynamic learning object repository that implements the *accessForAll* element.

See: http://www.barrierfree.ca/

Examples of AccLIP in action

The following examples show some of the main features of Accessibility for LIP in the XML (eXtensible Markup Language) format that it uses

The following example shows some of the preferences that could be set for a screen reader.

```
<screenReaderGeneric>
<link usage="required" value="speakLink"/>
<speechRate usage="preferred" value="180"/>
</screenReaderGeneric>
```

This example shows references that can be set for an alternative pointing device.

```
<alternativePointingGeneric>
<handedness usage="preferred" value="right"/>
<doubleClickSpeed usage="preferred"
value="0.4"/>
</alternativePointingGeneric>
```

This sample shows the preferences that can be set for alternatives to text.

```
<alternativesToText>
<graphicAlternative usage="required"
value="true"/>
<signLanguage usage="prefers" value="British-
BSL"/>
</alternativesToText>
```

Resources

People, products and resources

The CETIS-TechDis Accessibility SIG (Special Interest Groups) is one of a number of groups established by CETIS (Centre for Educational Technology Interoperability Standards). It aims:

• to make implementers of content and systems for learning technology in the FE (Further Education) and HE (Higher Education) sectors aware of accessibility guidelines and specifications for e-learning;

• to give guidance on using these accessibility guidelines and specifications to learning technology developers and implementers, and to e-learning content authors;

• to promote the communication flow between the FE and HE community and the specification producers;

• to track issues of accessibility across the relevant IMS specifications and other standards bodies as appropriate;

• to act as a discussion and dissemination forum, focusing on good practice in making learning technology accessible to all.

Contact Sharon Perry at s.perry@bangor.ac.uk, or go to: http://www.cetis.ac.uk/members/accessibility/index

Resources on the internet

The AccLIP and the Accessibility for Meta-Data (AccMD) specifications as well as the IMS Guidelines for Developing Accessible Learning Applications (Accessibility Guidelines) are available from: http://www.imsglobal.org/accessibility/

About this guide

This guide was produced by CETIS, the Centre For Educational Technology Interoperability Standards. For more CETIS briefings, visit http://www.cetis.ac.uk/static/briefings.html.

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About CETIS

CETIS is the JISC's Centre For Educational Technology Interoperability Standards. For more information visit the CETIS website at http://www.cetis.ac.uk/