Open & Closed Project
Uniting global knowledge of accessible media

Infrastructure development
The Accessibility Exchange™ format (.xex™)

The need

Today, it's almost impossible to transfer captions, subtitles, or audio-description or dubbing tracks from one format or platform to another. As a result, we're faced with extensive – and expensive – duplication of effort.

Think of a movie that ends up on home video, on DVD, and on TV in different countries. If company *A* captions the movie for its first run in theatres, and company *B* later captions it for home video while company *C* captions it for DVD, and company *D* thereafter captions a different version for TV, and, later still, company *E* captions the movie for TV in a different country using a different captioning system, then the entire process – transcription, editing, timing, placement, proofing, and output – will have been engaged *five full times*. And that's just for one movie.

Duplication of this sort gives rise to further problems:

¶ **Multiple movie caption and description files.** In a variant of the first example, a single film may be captioned for first runs in movie houses three different times (once for North American closed captioning, one more time for U.K. projected open captioning, and a third time for U.S. and Australian burned-in open captioning).

¶ **DVD reformats.** Movies and TV series previously closed-captioned must be reformatted for DVD subpictures, which have different requirements. To add Line 21 captions to a DVD, you usually need a special file format different from those of broadcast or home-video caption files.

¶ **Language variation.** A number of versions of an original film may be created in a single target language (like Spanish), necessitating four separate files rather than a single file with variations for specific dialects.

¶ **Language mismatching.** Watch a foreign film on DVD with English captions or subtitles (which may themselves not be the same) and an English dubbing track all running at once. Typically, each format derives from its own script. Subtitles and captions should match the dubbing track, but rarely do.

¶ **Dubbing & description scripts & recordings.** Programming – movies in particular – can end up being described multiple times. But today, it's difficult even to reformat a description track to accommodate commercial breaks or TV-friendly versions.

¶ **Description of subtitles.** Adding audio description to a subtitled program, or even a segment of a program, often requires retyping the subtitles, a needless duplication.

¶ **Multiple accessibility formats.** A single TV show – like *The Simpsons* or *CSI* – may be captioned and described in English, *then* dubbed into French and captioned in French, *then* re-sold on DVD with newly-made English closed captions and English and Spanish subtitles in the form of subpictures. In every step of the process, each new adaptation is created from scratch and is not preserved in a universal format for later reuse.

What's missing in all the above? *Interoperability* – the capacity of software and hardware on multiple machines from multiple vendors to communicate.

Time & money

The duplications caused by the lack of an interchange format mean that **producers lose money** and accessibility service providers **waste time.**

¶ Without interchange formats, producers run the risk of **trashing their assets.** An item, once captioned, may have to be recaptioned later, even for a transformation as simple as a syndication reformat. The investment in the original captions has no lifespan beyond the *original* format. Producers have better things to do with their money than ordering the same service over and over again.

¶ Service providers are deadline-oriented. What could be a simple reformatting job accomplished in hours becomes the equivalent of an all-new job that may take days to finish. The time spent reworking an item from scratch is **time taken away from meeting deadlines** on true first-run productions. And to compound the problem, the output on *those* jobs will also probably not be preserved for later use.

We already live in an enviroment where nearly all programming has to be adapted for accessibility. (Even if you don't caption or describe an item, it will probably end up subtitled or dubbed at some point.) That means a high investment for producers and distributors and a lot of work by accessibility providers. It's time to build some longevity into the process.

The solution

The Open & Closed Project proposes to develop Accessibility Exchange™ (.xex™), a universal file format for the preservation and interchange of captioning, subtitling, audio description, and dubbing. .xex files will work with any authoring environment that chooses to support it, and on any platform and in any language supported by Unicode character encoding. The format's many capabilities may include:

¶ **Inclusion of variants.** All the following can be embodied within a *single* file and, depending on software capabilities, called up manipulated on demand: A verbatim transcript (in several formats, including screenplay and spotting list); caption versions created for first-run movie systems, NTSC Line 21, PAL Line 22/25, World System Teletext, DVD subpictures, and online streaming; and language and content variants (U.S., U.K., and Canadian spellings, for example, or verbatim and easy-reader versions). Just as closed captions or closed subtitles can be turned on and off, the many variations embedded in a file can be displayed or hidden.

¶ **Translation interface.** .xex files can work as inputs *and* outputs for translators. Original text can interface with translation software *and* specialized software for subtitling or script creation. The resulting translation can be fed right back into the single .xex file.

¶ **Same-language titles.** Captions are not the only form of titles rendered in the same language as the audio. .xex will support same-language subtitles, as often used in Chinese-language and Indian cinema and everywhere in karaoke.

¶ **Timecode manipulation.** Authors can produce accessibility features for 24, 25, 29.97, 30, 48, 50, 59.94, or 60 frames per second (or any arbitrary framerate). Device profiles will reflect performance limitations (e.g., speed limits in Line 21 captioning). Other software reading this same file can reset the framerate and reuse the existing features.

¶ **House style.** The .xex format will work with the Open & Closed Project's recommended practices (a *single* set of unified recommendations for captioning, subtitling, audio description, and dubbing), but until those recommendations are in place, .xex will

support house-style variations, including case (mostly-upper-case vs. mixed-case) and presentation methods (e.g., pop-on vs. roll-up captioning).

- ¶ **Sign language.** In some countries, sign-language interpreters are a viable method of making TV and other programming accessible. .xex will include provisions for the addition of sign language, and will accommodate sign languages as source and target files in original and translated versions.
- ¶ **Editable and locked forms.** .xex files won't be limited to written words. The same file can include editable forms (like plain text) and frozen forms derived from them (like finished recordings and DVD subpicture bitmaps), and hotlink between the two.

XML for universality

The .xex file format will be based on an XML DTD (an Extensible Markup Language document-type definition). XML files are typically simple text files; however, to accommodate multiple languages, Unicode character encoding can and will be used.

Since nearly every authoring system in use today can write a text file, it will not be difficult to upgrade software to produce .xex-compatible files. In fact, .xex could become the native file format of captioning, subtitling, description, and/or dubbing software in the future.

XML is a *structural markup language.* XML files can contain information itself and also information *about* the information. For example, a single sentence could be marked up to mean "This is a verbatim transcript of a U.K. English source meant for captioning for DVD." Such *semantic* markup will enable later devices to reformat, reuse, extract from, search, translate, or perform any of a large range of actions on the original data – for example, transforming that same sentence into an edited U.S. English subtitle for use as a children's learning tool.

An open standard

.xex will be developed in an open consultation process and will be usable by all interested parties. Licensing may take a form similar to those proposed by the Creative Commons, where Open & Closed retains the right to be identified as author of the format but anyone may use it. We don't anticipate imposing any kind of royalty to use the format, since that would impair the goal of interoperability.

The Open & Closed Project will work to ensure *existing-formats interoperability* in related sectors, such as:

- ¶ XHTML
- ¶ Synchronized Multimedia Integration Language (SMIL)
- ¶ Translation interchange formats, including Translation Memory Exchange (TMX) and Localization Interchange File Format (XLIFF)
- ¶ DAISY electronic talking books
- ¶ Open eBook Publication Structure (OEBPS)
- ¶ Composite Capabilities/Preferences Profiles (CC/PP)
- ¶ ComicsML
- ¶ DVDSubML
- ¶ Tagged accessible PDF

We'll also collaborate with the World Wide Web Consortium's Timed-Text Working Group and SMPTE's DC28.2W Subtitles and Captions Adhoc Group, among other interested parties. And not only will .xex use Unicode character encoding, we'll propose a custom character subset for captioning and subtitling.

Benefits

¶ **Universality.** Everyone will use the same non-proprietary format with broad, well-defined capabilities.

¶ **Futureproofing.** You can caption, subtitle, describe, and/or dub a production today and know you'll be able to reuse all those features later.

¶ **Consistency.** You can create accurate captions and subtitles from dubbed versions of an original.

¶ **Analogous forms.** For the first time, you can easily unite caption transcripts and audio-description scripts to create searchable, archivable, *resellable* text-only analogues of multimedia.

¶ **Comprehensiveness.** .xex will accommodate a huge range of formats and variations and, through proper semantic markup, will enable quick transformation from one format to another.

¶ **Cost savings.** You won't have to add features from scratch to an item that already has those features in some other format or somewhere else in the world. You won't have to reinvent the wheel.

Partnerships & next steps

Development of the .xex file format requires industry support, both financial and in-kind. We expect it will take a full year to produce a draft specification. A budget has not yet been established, but should be in the six-figure range in Canadian dollars.

Contact

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