Kultur Technical Report

This report describes the enhancements that have been made to the EPrints digital repository platform to support the requirements and goals of the Kultur project and the wider creative arts community.

Each enhancement is briefly described, with technical details provided for repository developers.

> **Technical details:**
>
> For EPrints technical documentation visit http://wiki.eprints.org/w/Documentation

1   Repository homepage

Problem: The default repository homepage is very plain and not in keeping with a creative arts institution.

Solution: Take advantage of the wealth of visual material in the repository to enhance the homepage.

Figure 1: UAL Research Online front page, with slide show and latest items

1.1   Slide Show

Showcase previews of selected repository content (Figure 1). The preview image changes automatically every 10 seconds, cycling through the selected content. A

thumbnail strip allows visitors to go back to a previously displayed image or navigate through the slide show manually. Clicking on the preview image takes the visitor directly to the record page for that item.

Technical details:

To add a slideshow to a page:
```
<div id="slideshow"></div>
<epc:print expr="random_documents('list','preview',1,6)" />
```

This chooses 6 previews at random each time the frontpage is regenerated. Schedule `bin/generate_static` hourly to generate a new slide show every hour.

Configuration files:

`cfg/cfg.d/random_documents.pl` - implements `random_documents( TYPE, SIZE, COLS, ROWS )` where TYPE is one of "list" or "table" and SIZE is one of "small", "medium", "preview" or "lightbox".

`cfg/static/javascript/auto/90_local.js` - converts slideshow div into rolling slideshow (uses scriptaculous library)

1.2   Latest Items

Displays information about the 3 most recent deposits, including 3 thumbnails (Figure 1).

Technical details:

To add latest items to a page:
```
<epc:print expr="kultur_latest(3)" />
```

This inserts the 3 most recent items each time the frontpage is regenerated. Schedule `bin/generate_static` hourly to update the list every hour.
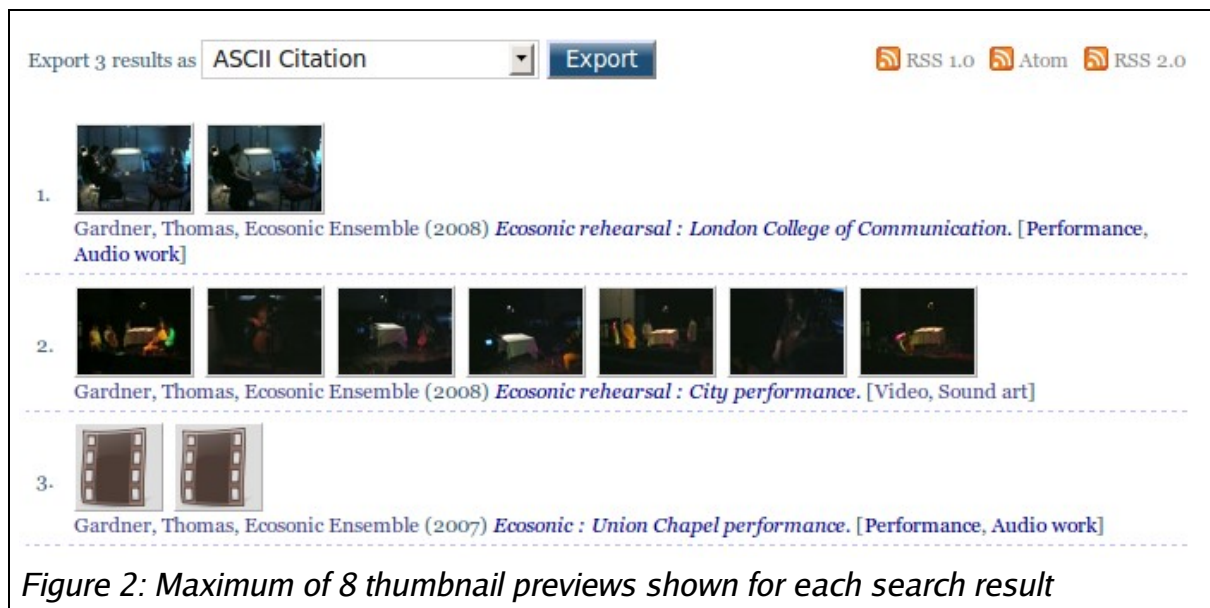
Configuration files:

`cfg/cfg.d/random_documents.pl` - implements `kultur_latest( MAX )` where MAX is the maximum number of items to show.

2   Searching

Problem: Search results include thumbnail previews for all files. Many deposits have a large number of multimedia files attached so the search results page is swamped with thumbnails.

Solution: Limit the number of thumbnails shown.

Figure 2: Maximum of 8 thumbnail previews shown for each search result

Limit number of thumbnails displayed to 8 (Figure 2). If there are more thumbnails than can be shown, this is indicated, eg. "+ 10 others".

> **Configuration files:**
>
> `cfg/cfg.d/eprint_fields.pl` - overrides the default thumbnail rendering method.

3   Browsing

Problem: Navigating the browse view menus and sub-menus can be tricky.

Solution: Provide a "bread crumb" trail to aid orientation.

> **Configuration files:**
>
> `cfg/lang/en/phrases/zz-kultur.xml` - overrides default view titles

Figure 3: Breadcrumb trail when browsing 2D Design category

4   Abstract pages

Problem: The default abstract page focuses on metadata rather than content. In a creative arts repository the content should be the focus.

Solution: Focus on content first, using previews whenever possible.

4.1   Tabs

Split the abstract page into a series of "abs":

- Images - shows thumbnail previews of image files (Figure 4)

- Video/Audio - shows thumbnail previews of video files (Figure 6), and lists audio files

- Documents - shows thumbnail previews of text files

- Restricted - lists restricted (non Open Access) files
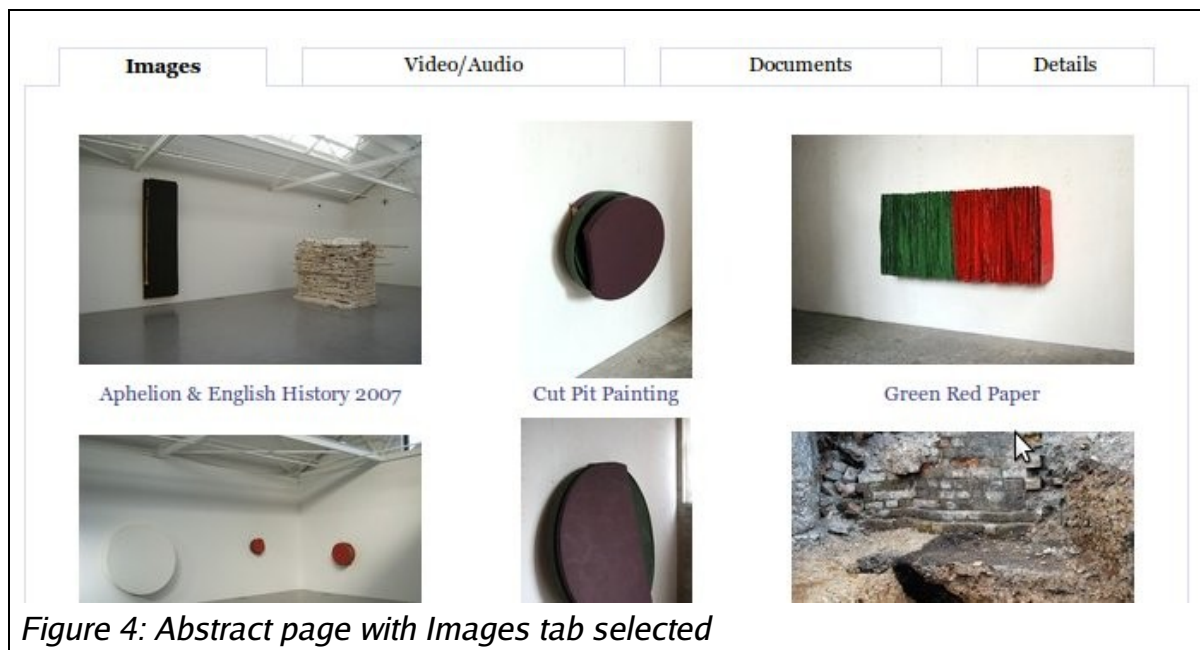
- Details - lists metadata (Figure 5)

Figure 4: Abstract page with Images tab selected

Technical details:

The core EPrints API provides methods for rendering tabs, with tab switching handled by Javascript libraries.

Configuration files:

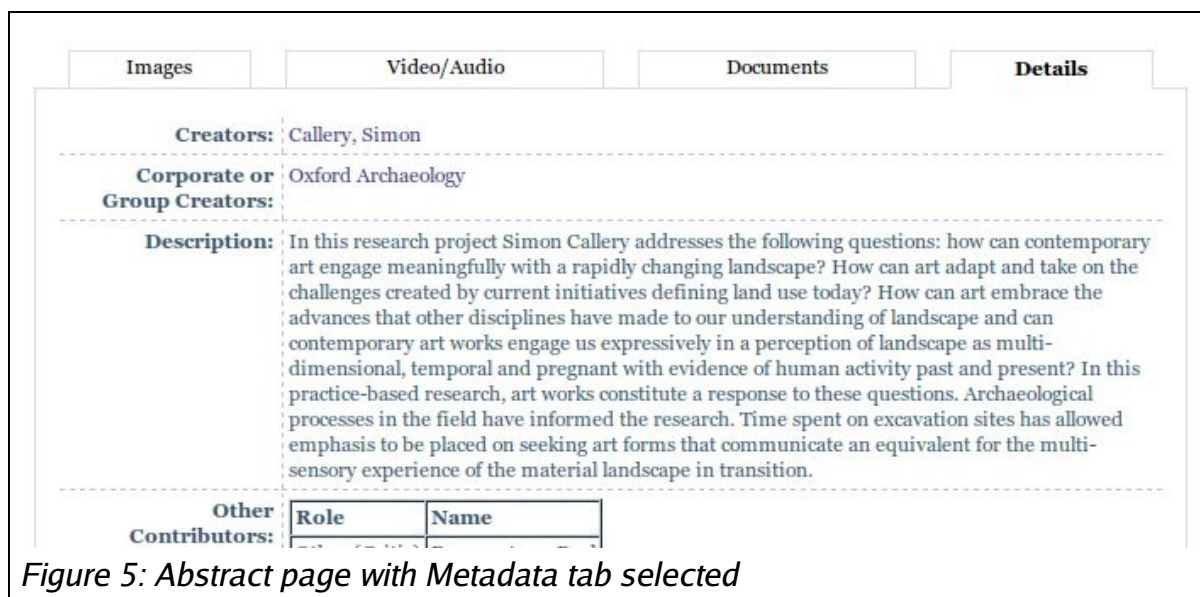`cfg/cfg.d/eprint_render.pl` - generates tabbed abstract pages

Figure 5: Abstract page with Metadata tab selected

4.2   Video Thumbnails

Generate thumbnails of video files instead of using a generic video icon (Figure 6).

Technical details:

ffmpeg is used to extract a single JPEG frame from a video. First try grabbing a frame 5 seconds into the video; if that fails grab the first frame.

Configuration files:

`cfg/plugins/EPrints/Plugin/Convert/Local/ThumbnailVideos.pm` - **generate still images from videos.**
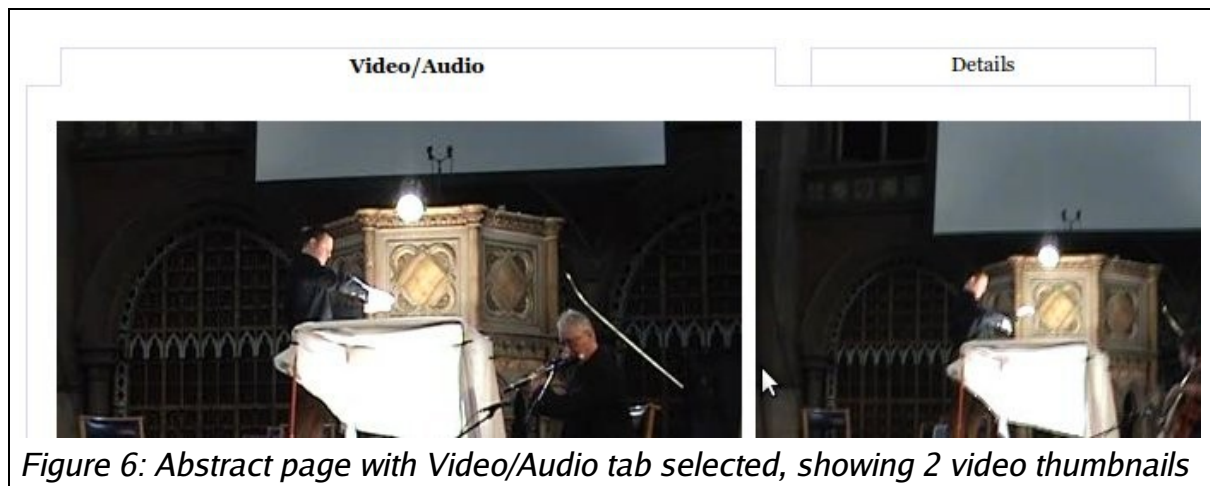

Figure 6: Abstract page with Video/Audio tab selected, showing 2 video thumbnails

4.3   Variable size thumbnails

Vary the size of the preview thumbnail according to the number of files. Items with a single file will have a large preview (Figure 7). Items with several files will have smaller previews (Figure 8). The caption shown beneath each thumbnail will also be reduced in length according - hovering over the thumbnail will show the full caption.
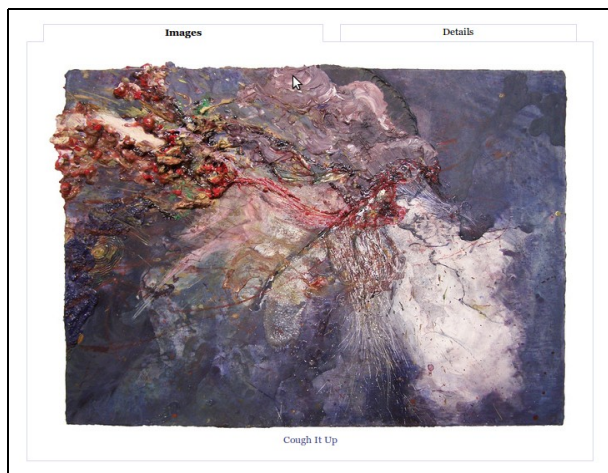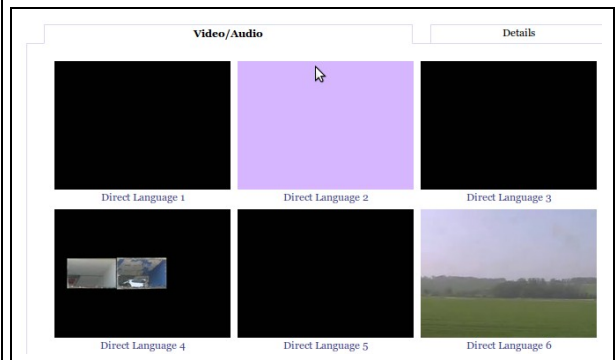
Figure 7: Large preview for single image
file

Figure 8: Smaller previews for several
video files

Technical details:

There are four thumbnail sizes available: small, medium, preview and lightbox (Table 1).
These are rendered 7, 3, 2 and 1 images per row respectively.

Configuration files:

`cfg/cfg.d/eprint_render.pl` - select appropriate thumbnail size

Name	Width	Height
small	66	50
medium	200	150
preview	400	300
lightbox	640	480

Table 1: Thumbnail preview sizes (pixels)

4.4   Thumbnail cropping

Provide a consistent thumbnail layout by resizing thumbnails to the same dimensions
(Table 2).

Original	Medium (padded)	Small (cropped)

Table 2: Using padding and cropping to generate thumbnails of a consistent size

Technical details:

The Image Magick "convert" command is used to generate small (cropped) thumbnails:
```
system($convert, "-strip", "-colorspace", "RGB",
"-thumbnail","$geom^", "-gravity", "center", "-extent", $geom,
$src."[0]", $dir . '/' . $fn);
```

And medium (padded) thumbnails:
```
system($convert, "-strip", "-colorspace", "RGB", "-bordercolor",
"white", "-border", "1x1", "-trim", "+repage", "-size", "$geom",
"-thumbnail","$geom>", "-background", "white", "-gravity", "center",
"-extent", $geom, $src."[0]", $dir . '/' . $fn);
```

Configuration files:

```
cfg/plugins/EPrints/Plugin/Convert/Local/*
``` - generate thumbnails

4.5 PDF Images

A PDF file may contain visual content (such as a poster) or textual content (such as a journal article). By default PDF files are treated as text. A *PDF Image* format was added to identify PDF files with visual content so that they will be treated as an image and listed on the Images tab.

5 Viewing

Problem: Large multimedia files can be difficult to display and/or download. Images open full size in the browser window, and a special player may be required to play audio/video files.

Solution: Lightbox-style previews for all multimedia files.

Figure 9: Lightbox preview of an image file

Clicking on the thumbnail of a multimedia file activates the lightbox preview. The page content is dimmed and a larger preview of the file is displayed in the center of the page (Figure 9). The visitor can navigate through the lightbox previews using next/back links. The caption, license, copyright statement and link to download the original file are displayed beneath the preview.

In the case of video and audio files, a low resolution version can be played directly from the lightbox preview (Figure 10).

Technical details:

Lightbox implementation is based on the Lightbox2 library http://www.lokeshdhakar.com/

ffmpeg is used to generate Flash previews of video files and mp3 previews of audio files. Schedule `bin/generate_video_previews` nightly to generate video and audio previews.

Flash video previews are played back in FlowPlayer http://flowplayer.org/

MP3 previews are played back using MP3 Player http://flash-mp3-player.net/

Configuration files:

`cfg/static/javascript/auto/lightbox.js` - Javascript library

`cfg/static/style/images/lightbox/` - images used by lightbox

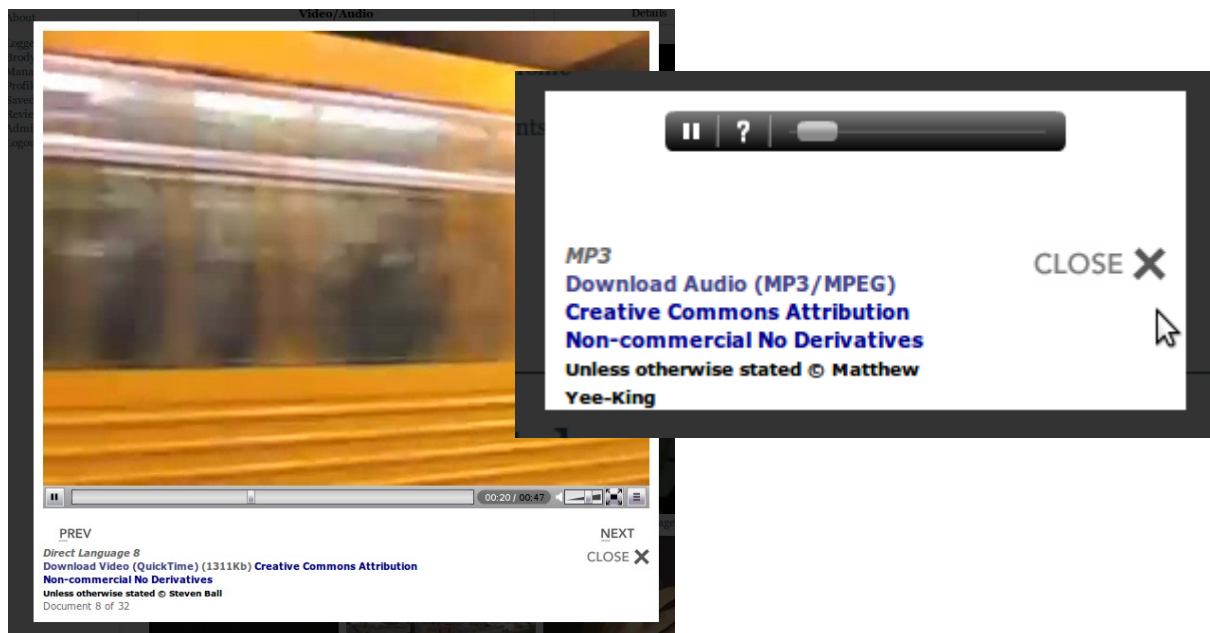`cfg/static/FlowPlayerClassic.swf`,`cfg/static/player_mp3.swf` - players

Figure 10: Playing video (left) and audio (right) previews

6 Depositing

Problem: The default deposit workflow is geared towards text-based research outputs such as journal articles and books.

Solution: Adjust the workflow to suit creative arts deposits.

6.1 Preview of uploaded files

Figure 11: Thumbnail preview of uploaded documents shown on all deposit workflow stages

Show preview of the uploaded files on each stage of the deposit workflow (Figure 11). This provides an *aide-memoir* to the depositor as they enter metadata about the files.

Technical details:

To add the preview to a workflow stage:

```
<stage name="category">
    <component type="KulturRenderDocuments"></component>
    ...
</stage>
```

Configuration files:

```
cfg/workflows/eprint/default.xml
```
 - deposit workflow

```
cfg/plugins/EPrints/Plugin/InputForm/Component/KulturRenderDocument
s.pm
```

6.2   Metadata

See separate Metadata Report.

6.3   Additional audio and video formats

Support additional audio and video files (Tables 3 and 4).

MIME Type	Description	File Extension(s)
audio/ac3	Audio (AC3)	*.ac3
audio/mpeg	Audio (MP3/MPEG)	*.mp3, *.m4a
audio/x-wav	Audio (Wav)	*.wav
image/vnd.adobe.photoshop	Image (Photoshop)	*.psd
video/ogg	Video (Theora/Ogg)	*.ogv
video/x-ms-wmv	Video (Windows Media)	*.wmv
video/x-flv	Video (Flash)	*.flv

Table 3: Additional audio and video formats

Technical details:

To add a new format:

Add the mime-type to `cfg/namedsets/document`

Add a phrase for the format to `cfg/lang/en/phrases/document_formats.xml`

Add a file-extension match to the `guess_doc_type()` method in
`cfg/cfg.d/document_upload.pl`

Add support for the new format to thumbnailing plugins (ffmpeg for videos, ImageMagick for photoshop).

Add icon for new format to `cfg/static/style/images/fileicons/`
(Note that `perl_lib/EPrints/Document.pm` is tweaked to fall back to a generic icon if the specific icon is not present. For example if audio_ac3.png is not available, audio.png will be used instead).

MIME Type	Number of documents
image/jpeg	644
application/pdf	169
image/tiff	99
video/quicktime	67
audio/mpeg	56
video/mpeg	37
video/x-flv	29
other	23
image/vnd.adobe.photoshop	21
image/pdf	8
application/vnd.ms-powerpoint	7
audio/ac3	7
text/html	6
image/gif	3
audio/x-wav	2
image/bmp	2
video/x-ms-wmv	1
video/x-msvideo	1
application/zip	1
text/plain	1

Table 4: Use of file formats in KULTUR demonstration repository

7   Attribution of images

Figure 1 UAL Research Online front page displaying: Fashion In Film (2008) *If looks could kill: cinema's images of fashion, crime and violence - fashion in film festival 2008* [Exhibition/show, Fashion, Film]; John Wynne and Tim Wainwright (2008), *Transplant*; Thomas Gardner (2008), *Ouija Board: Union Chapel* [Sound art, Site-specific work, Audio work].

Figure 2 Thomas Gardner, *Ecosonic Ensemble (2008) Ecosonic rehearsal: London College of Communication* [Performance, Audio work]; Thomas Gardner, *Ecosonic Ensemble* (2008) Ecosonic rehearsal: City Performance [Video, Sound art]; Thomas Gardner, Ecosonic Ensemble (2007) *Ecosonic: Union Chapel Performance* [Performance, Audio work].

Figure 4 Callery, Simon (2008) *Thames Gateway Project: seeking new art forms for the representation of the experience of contemporary landscape.* [Drawing, Exhibition/show, 3D Design, Painting, Installation, Sculpture].

Figure 6 Gardner, Thomas, Ecosonic Ensemble (2008) *Ecosonic rehearsal : London College of Communication.* [Performance, Audio work]

Figure 7 Lee, Mindy (2008) *Cough it up.* [Painting]

Figure 8 Ball, Steven *Direct language project.* [Video]

Table 2 Williams, Keir and Poolman, Chris (2008) *Protect our pubs!* [Video, Exhibition/show, Drawing, Theatre, Typography, 3D Design, Other, Digital art, 2D Design, Public art, Performance]

Figure 9 Heywood, Anthony (2007) *Van Gogh Series.* [Public art, Site-specific work, Sculpture]

Figure 10 Ball, Steven *Direct language project.* [Video]

Figure 11 Carnie, Andrew (2004) *Eye: through the mirror darkly.* [Video]