	Digital Preservation Team	**Project Name:** Collection Profiling	**Date:** 2019-06-20
		Document Title: Collection Profile: 3D Content	**Version:** 1.0

Collection Profile Framework: 3D Content

British Library Digital Preservation Strategic Priorities, 2017 – 2020:

- Replace and enhance the existing technical repository infrastructure
- Ingest our digital collections into the new infrastructure for long term preservation
- Implement robust processes and reporting mechanisms to provide evidence of preservation
- Ensure content can be accessed by the Library's designated community.

Project Information

Author	Simon Whibley	Created On	2019-02-12

Document History

Date	Version	Author	Change Details
2019-02-12	0.1	Simon Whibley	First draft
2019-03-19	0.2	Simon Whibley	Expanded text
2019-04-01	0.3-0.6	Simon Whibley	Updated following interviews and discussion
2019-06-20	1.0	Simon Whibley, Michael Day	Revised text and further updates

Reference Documents

Date	Document Reference	Distribution
2017	Digital Preservation Strategy 2017 - 2020	Public
September 2018	Cyreal Recording Capture Records - Design Note v0.1	Internal
October 2018	3D Digitisation	Internal
October 2018	3D Modelling	Internal

Collection Profile Framework: 3D Content

1. Summary

Content type:	3D Content
Brief description:	The Library provides a 3D digitisation service allowing the creation 3D models from collection content. It also offers a service to external users to create 3D models.
Location:	Interim storage (and external cloud-based storage)
Curator / collection owner:	Adi Keinan-Schoonbaert (Digital Curator, overview) Subject curators (dependent on content type) Imaging Services
Interviews:	Tony Grant (Imaging Technical Manager, April-June 2019) Adi Keinan-Schoonbaert (Digital Curator, April-June 2019) Sandra Tuppen (Heritage Made Digital Portfolio Manager, April-June 2019) Andy Irving (Solutions Architect, June 2019)
Accrual status:	Policy: Active; Accrual method: digitisation Accrual periodicity: on-going, project-basis

2. What is 3D content?

Wikipedia provides the following description of 3D modelling:

"3D modeling is the process of developing a mathematical representation of any surface or object in three dimensions via specialized software."

The technological capability to digitise 3D cultural objects has increased in recent years.

3D content in the context of the Library's current processes refers to 3D models created from digitised images of an object's surface. In terms of this profile, 3D content currently is that created by the Library's Imaging Studio from objects in the Library's collections. It is also been offered as an external commercial service since April 2018. This profile also covers 360 degree panoramas.

3. Acquisitions

As of April 2018, collection items can be photographed by Imaging Services using a 3D photography rig composed of a set of cameras and a turntable. Metadata is created (model name, description, subject categories, tags, and license) and then sent to an external partner, Cyreal for all the model creation work. The original photographs[1] (Canon RAW CR2 files) are converted to TIFF and then exported into OBJ, MTL and JPG files to produce the 3D models. JSON and Agisoft psx project files are associated with each model[2]. The 3D models are then uploaded to the platform Sketchfab, a platform for publishing and viewing 3D, VR and AR content. Currently approximately 30 models have been created ranging in size from smaller models (around 30GB) to globes (about 350GB).

The Library has purchased a dedicated storage server to host the 3D models which can then be accessed via the IIIF-based Universal Viewer (UV). The server will store all the images originally captured, the JSON files associated with each model and the models themselves. The models used in the viewer will be in the GLB format[3] (a binary form of the glTF format (GL Transmission Format), the difference being it includes the textures rather than referencing them as external images). Once this storage solution is in place, Cyreal can begin sending the Library the files[4] they have created, which are currently only stored on their own servers. The 3D models could then be made visible on the UV using a process to generate the IIIF metadata. 3D models in the UV are displayed using neutral lighting[5] (i.e. no shadows) and are rotatable and zoomable but cannot be panned. Examples of models accessible via the Universal Viewer can be seen as part of the Nomad project, a collaborative external project[6]. As the models will not be ingested into the DLS or DAMPS systems in the short term, an interim solution will be required to provide access to the content as they will not have persistent identifiers[7].

In terms of 3D digitisation projects to date, some initial experiments took place in 2015/2016, modelling a selection of the Library's Hebrew manuscripts and Chinese oracle

[1] Internally, these are only stored locally on a non-networked PC
[2] Described in detail in the Cyreal Data Capture document
[3] This format was suggested by Ed Silverton (from the Universal Viewer Project) as a more suitable choice than glTF
[4] TIFF, the 3D models in both GLB and glTF formats alongside the .JSON files
[5] This is a standard approach for the Universal Viewer. Sketchfab has some of these features e.g. shadows
[6] https://nomad-project.co.uk/archive/index.html#?c=&m=&s=&cv=&manifest=https%3A%2F%2Fnomad-project.co.uk%2Fobjects%2Fcollection%2Fgourd%2Findex.json&xywh=-2655%2C-25%2C8309%2C2223
[7] A similar model has been used to make EAP content available

bones using Agisoft PhotoScan Pro. In 2018, further pilot sessions took place with different collection items using the photography rig.

The Library has also created 360 degree panoramas. These are scanned (400 images are taken) to create a panoramic composed of TIFF images. These are uploaded to create a 360 walkthrough tour using software such as Panotour Pro or web-based services such as 360player. These have mainly been used for external web pages so far (e.g. for blogs) and could be taken of an exhibition space or of a writing room (Hanif Kureshi is a past example[8]). In future, this could be provided as a service for external customers. Currently these are stored locally or via the web-based service. Born Digital Archives have a number of 3D panoramas which were created as part of archival acquisitions. These have never been made available to researchers.

The Library currently holds no born digital 3D content though there may be some content which is part of other collections such as Web Archiving.

The long term plan for this content is that it will be stored in the DAMPS repository, but there is no timeline for this currently.

4. Preservation Intent

It is the Library's intention that:

- Digitised representations of internal collection items should be preserved for as long as it is reasonable to do so and should not be discarded simply because of surrogacy status
- Digitised representations of content from external sources must be preserved in keeping with the acquisition agreement
- Content will be preserved in a manner that supports eventual searching, analysis, and re-use without requiring heroic efforts.
- Derivative copies created for access should only be retained for as long as they are useful

For this class of content, preservation is understood to mean that:

- All intellectual content included in the items as originally acquired shall be preserved.
- Embedded files shall be preserved in a manner fitting to the content type.
- Internal structural relationships between intellectual content shall be preserved
- The appearance of content as delivered to users may vary if not purposefully fixed in the original acquisition
- Additional metadata such as transcriptions are also to be preserved for as long as they are useful. Possibly OCR in the future as well.

5. Issues

- Models are currently only available via Sketchfab
- Need to clarify storage and retrieval solutions for the long-term
- High risk to original RAW images and TIFFs only currently stored locally or externally with partners
- Formats are still developing with no real *de facto* standard established
- No PUIDs for interim storage objects
- Possible a lack of flexibility with the glTF format[9]

[8] https://www.bl.uk/collection-items/hanif-kureishis-writing-study
[9] https://en.wikipedia.org/wiki/GlTF

6. Collection types

Collection	Acquisition Route	Nature	Type	Format	Role	Status	Action	Owner	Notes	Location
Digitised content	Internal (St Pancras Imaging Services)	Digitised	Image	CR2 (Canon RAW file)	Master	Non NPLD	Preserve	Imaging Services	Photos taken of object only (as of June 2019 approximately 20GB)	Local storage but Interim Storage recently acquired
Cyreal 3D models	External	Digitised	3D Model	OBJ, MTL plus associated files JSON, project Agisoft psx file)	Master	Non NPLD		Imaging Services	3D models created from Digitised content (as of June 2019 there have been 30 models created ranging in size from 30 to 350GB)	Cyreal (External)
3D Models	External	Digitised	3D Model	GLB, GlTF, TIFF, JSON	Master	Non NPLD	Preserve	Imaging Services	- No PUID - No checksumming - Lack of event metadata -Derived from models created by Cyreal	Currently only Cyreal but Interim Storage recently acquired
360 degree Panoramas	Internal (St Pancras Imaging Services)	Digitised	Image	TIFF	Master	Non NPLD		Imaging Services	Collection content or external customer work	Local storage. External via web-based software

Key:

Collection name – Content group, define level of granularity
Acquisition Route – How is the content acquired?
Nature – born digital or digitised?
Role – Master? Surrogate? Thumbnail? Access version? Original version?
Type – Image? Document? Media? Spreadsheet?
Format – JP2 / CD Rom etc.

Status – Legal status
Action – Preserve/Process/Destroy
Owner – responsible team /role in BL
Notes – issues specific to this part of the collection
Location – DLS or non-DLS (if not where?)

- end -