Preserving Virtual Archaeology (PVA)

Digital Preservation Workflow Webinar

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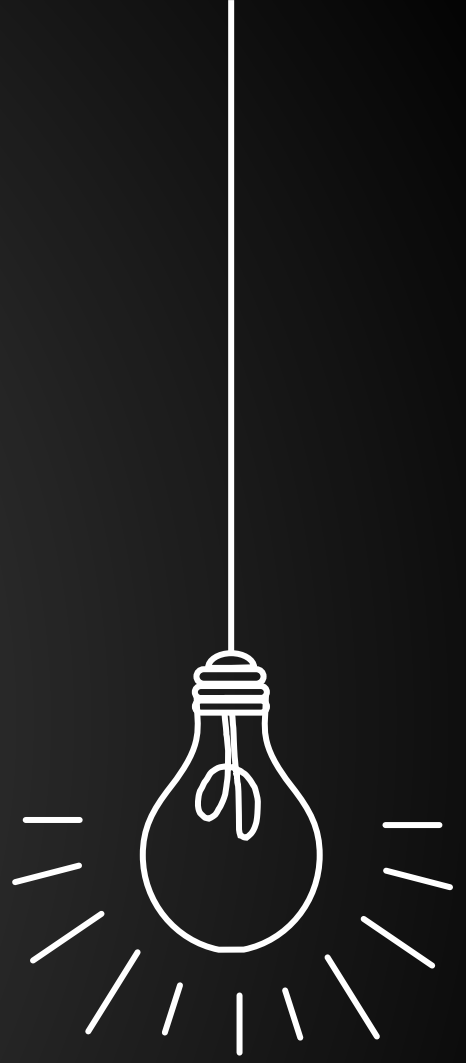
My PhD thesis received the Software Sustainability Institute's Research and Innovation award at the 2022 iPRES in Glasgow.

Outline

- Chain of Custody
- PIPs
- Installation of the Emulation Environment
- Rendering Case Study
- EF for VRs: Evaluation Criteria

Streamlined Process #1 (creating VRs)



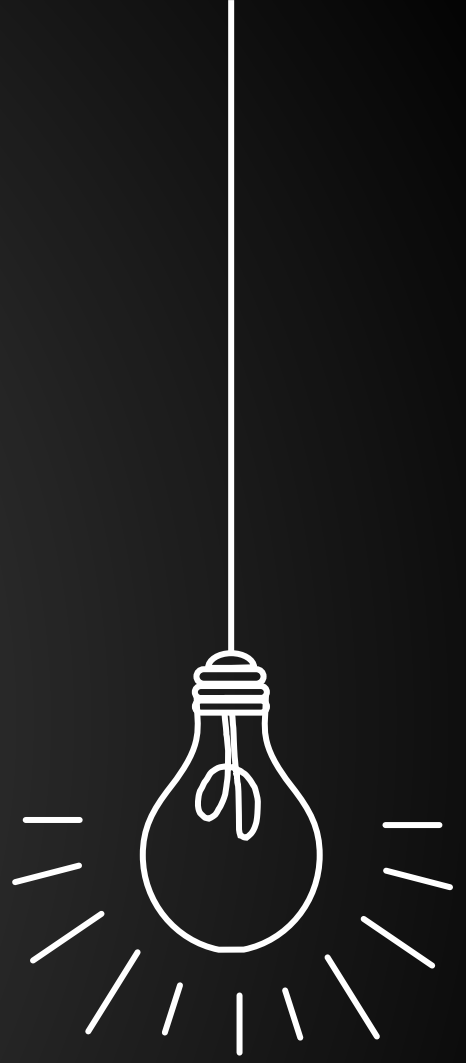
Chain of Custody

The process and agents involved in the production and “consumption” of a virtual reconstruction

- •Archaeologists
- •3D creatives
- •Public perception
- •Historians
- •Future archaeologists

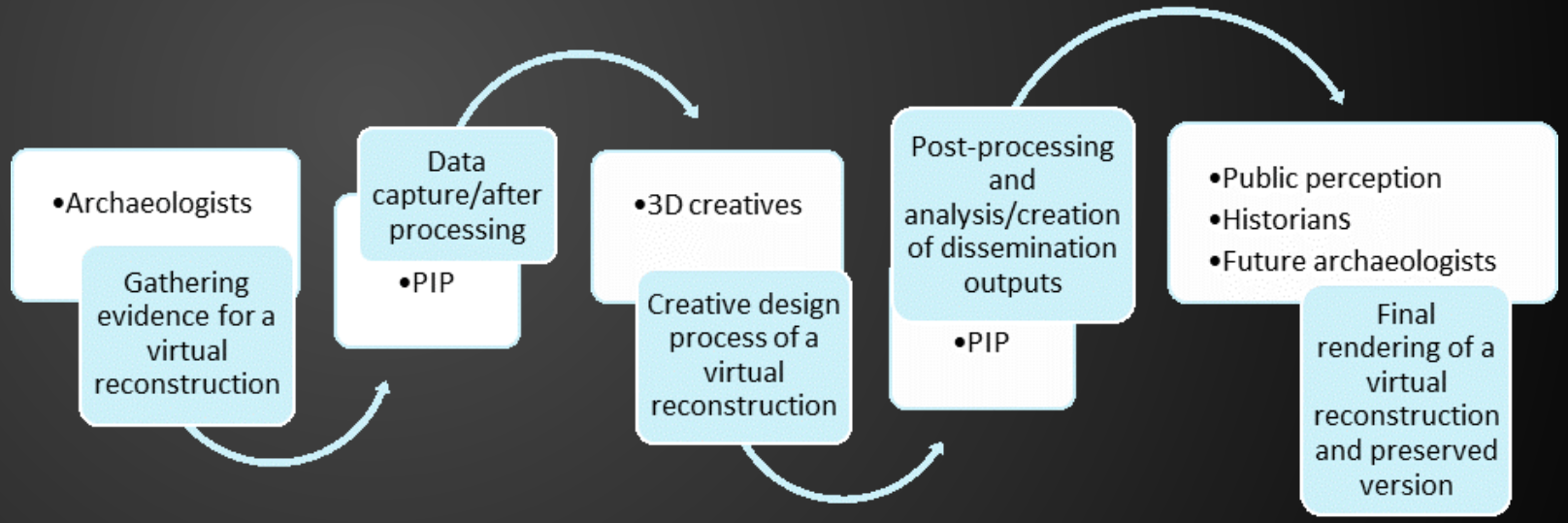
Gathering evidence for a virtual reconstruction → Creative design process of a virtual reconstruction → Final rendering of a virtual reconstruction and preserved version

Streamlined Process #2 (creating VRs)

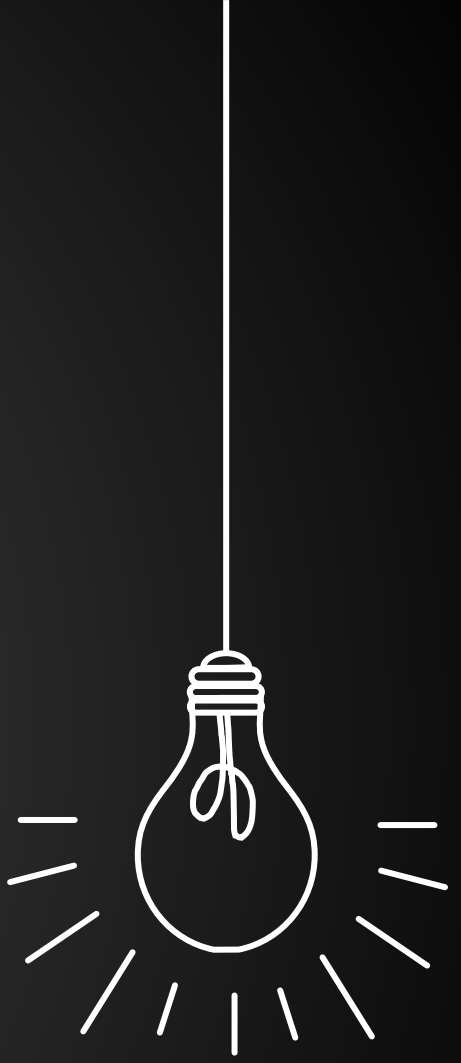


Preservation Intervention Points (PIPs)

The process, agents and PIPs involved in the production and "consumption" of a virtual reconstruction

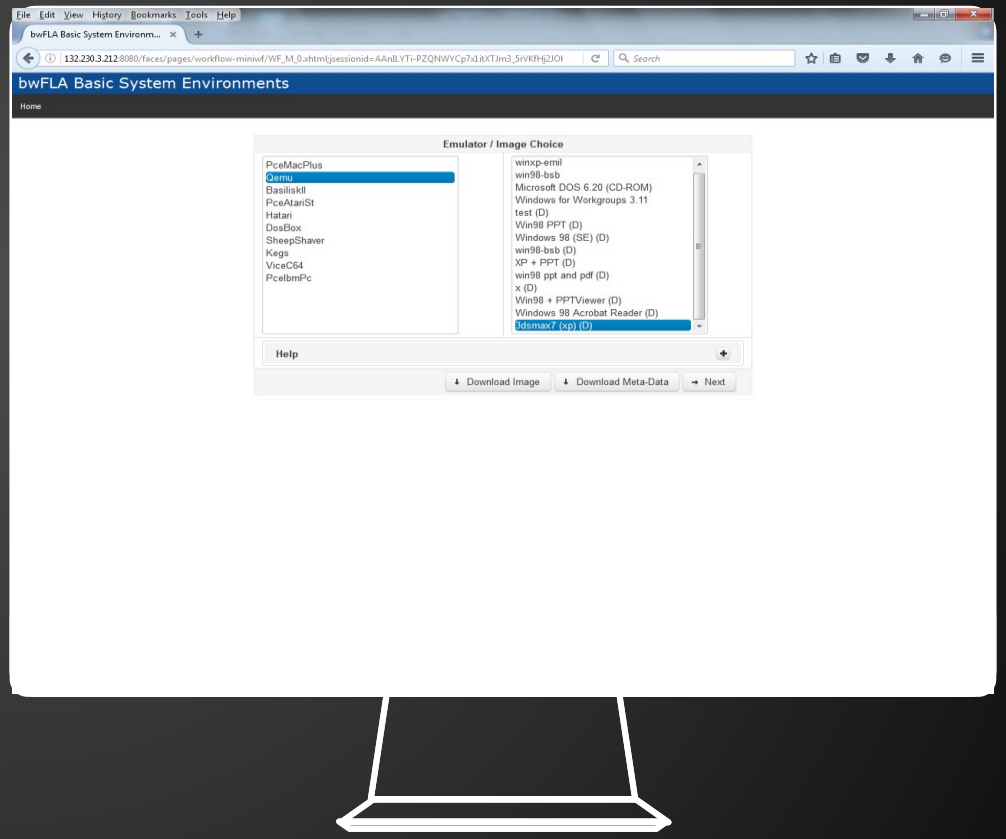


Streamlined Process #3 (preserving VRs)



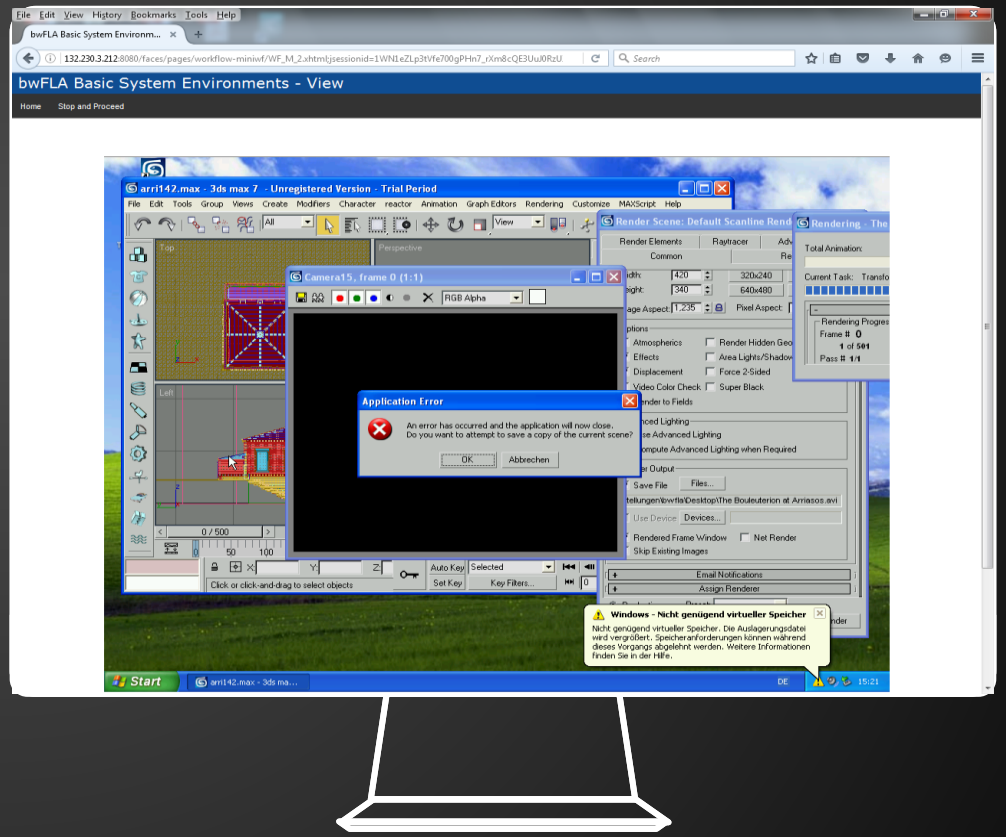
Installation of the Emulation Environment

The newly installed disk image ready to run on QEMU-KVM

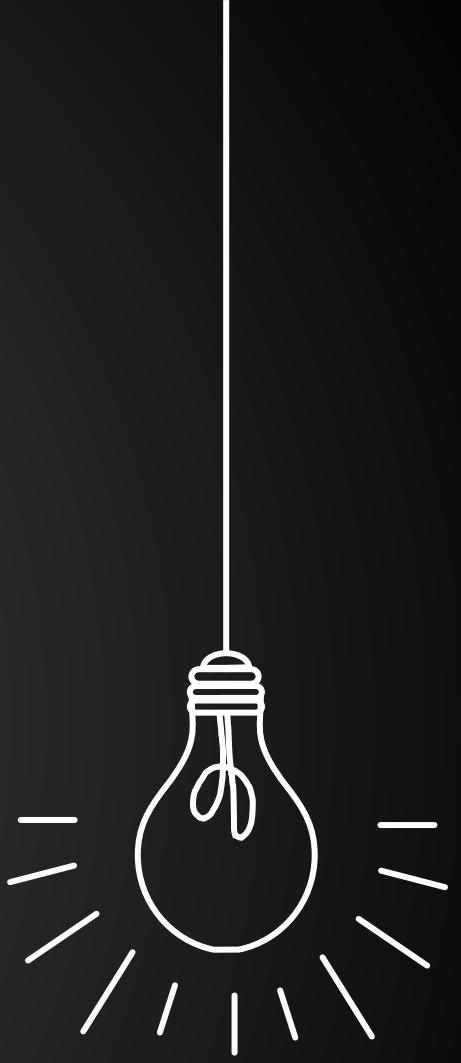


Error message: Low virtual memory in Windows XP

Installation Challenge

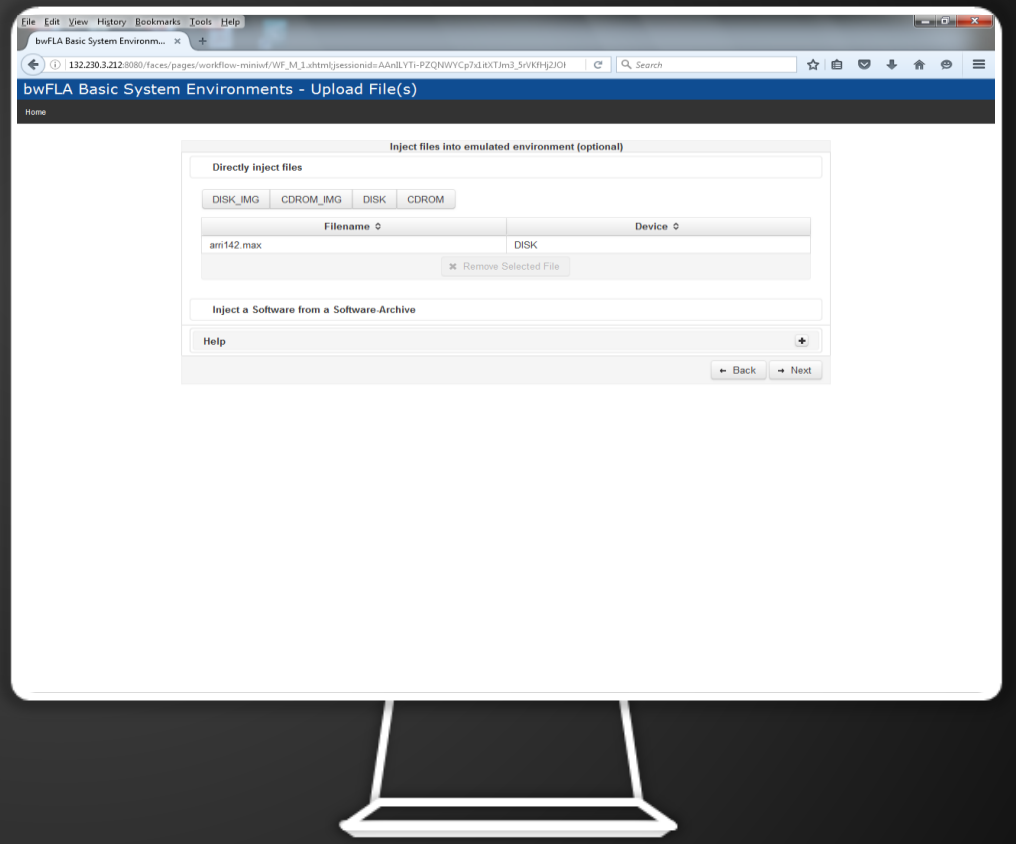


Streamlined Process #4 (preserving VRs)



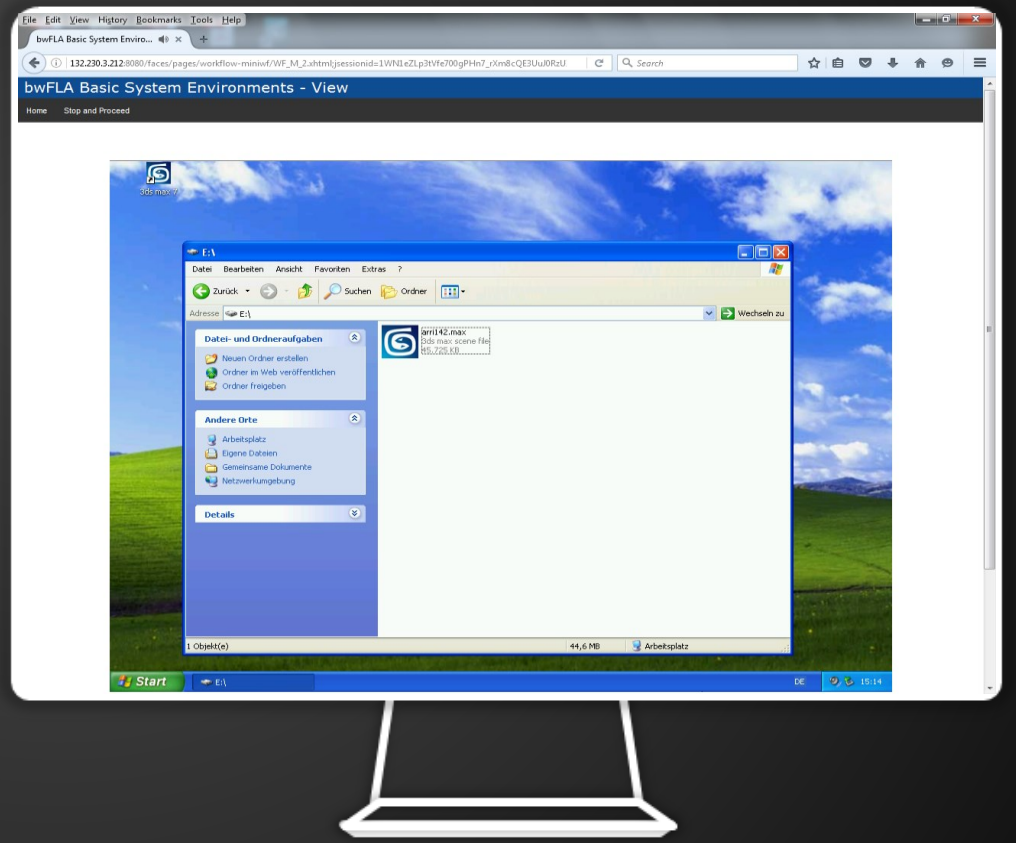
Rendering Case Study (1/8)

Inject the .max file from DISK (ingest process)



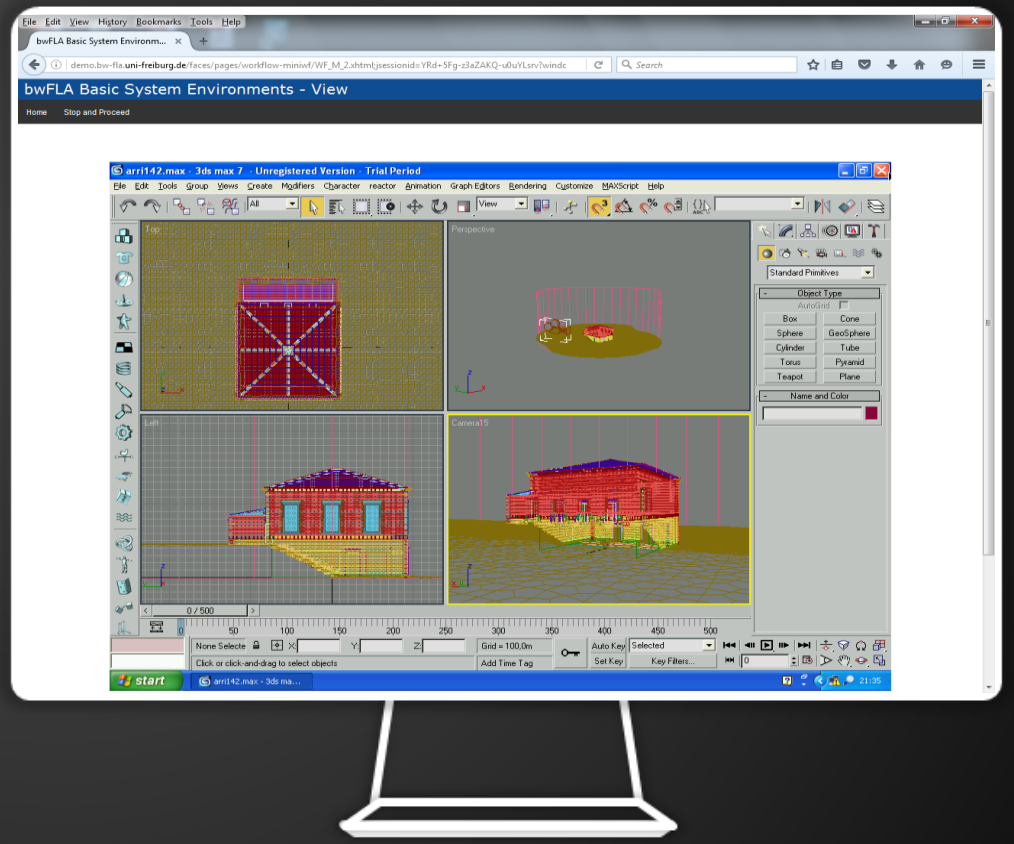
Rendering Case Study (2/8)

3D scene file of the VR uploaded from a local computer is available within the emulated environment



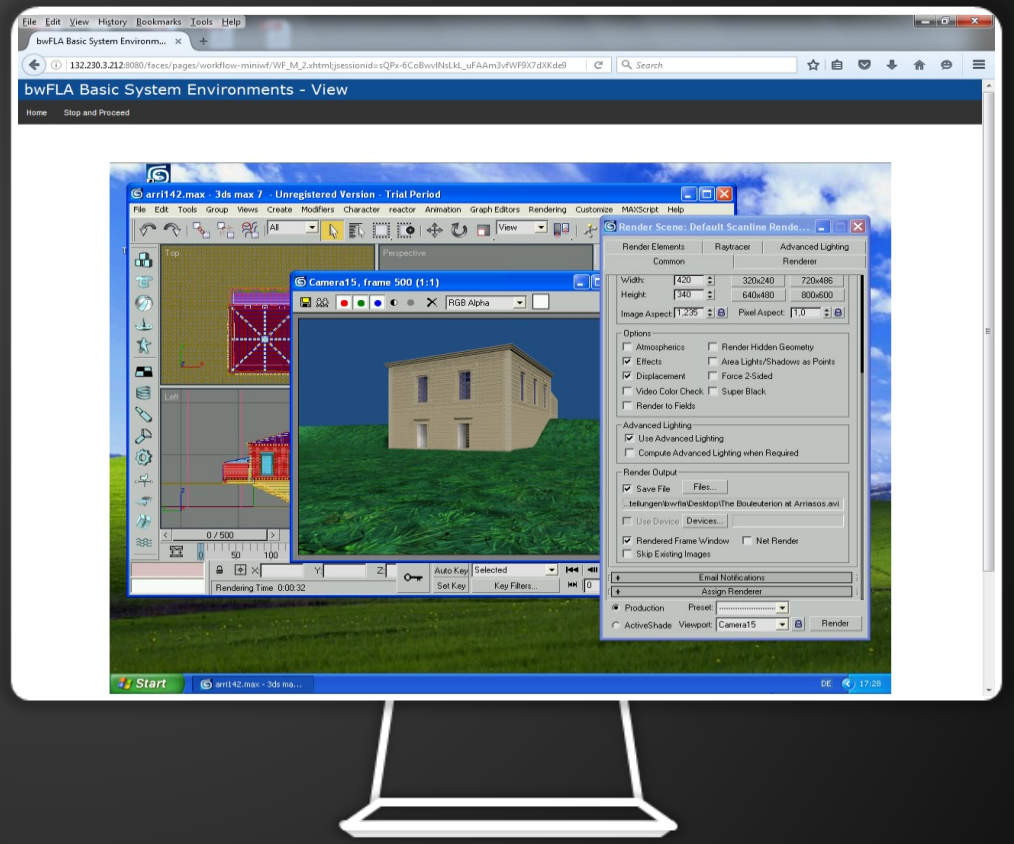
Rendering Case Study (3/8)

Render 3D scene file of the VR, uploaded from a local computer



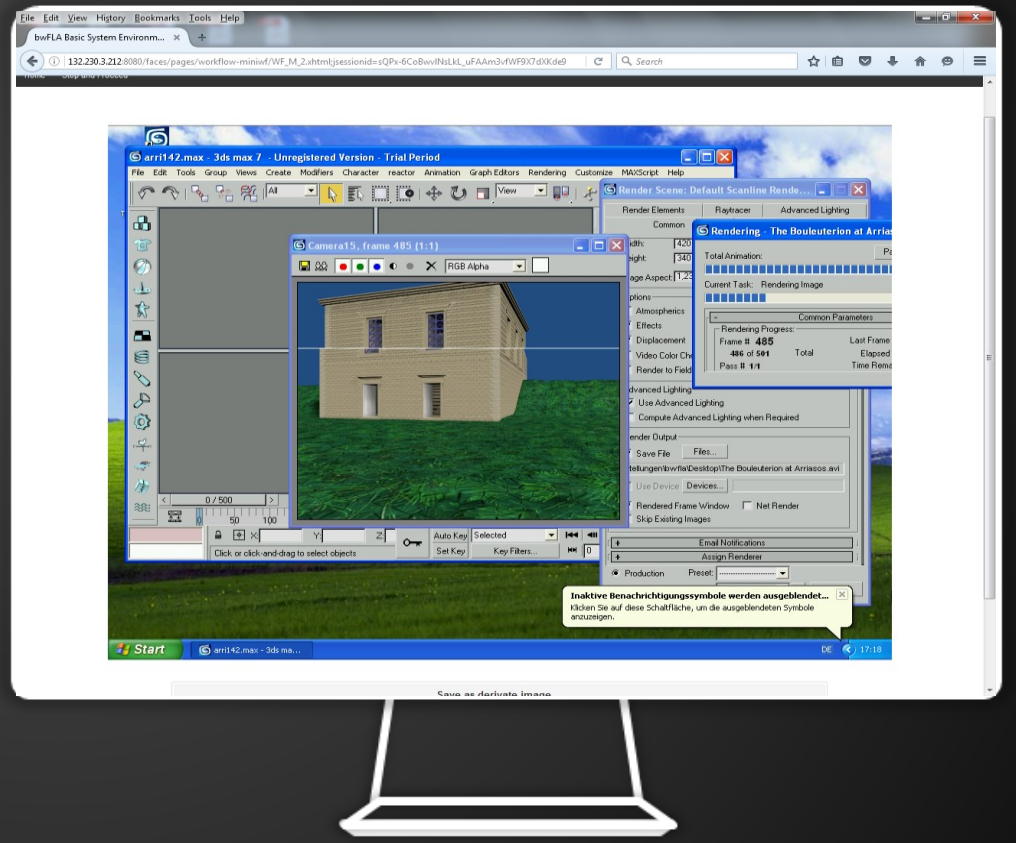
Rendering Case Study (4/8)

Configuring the rendering options



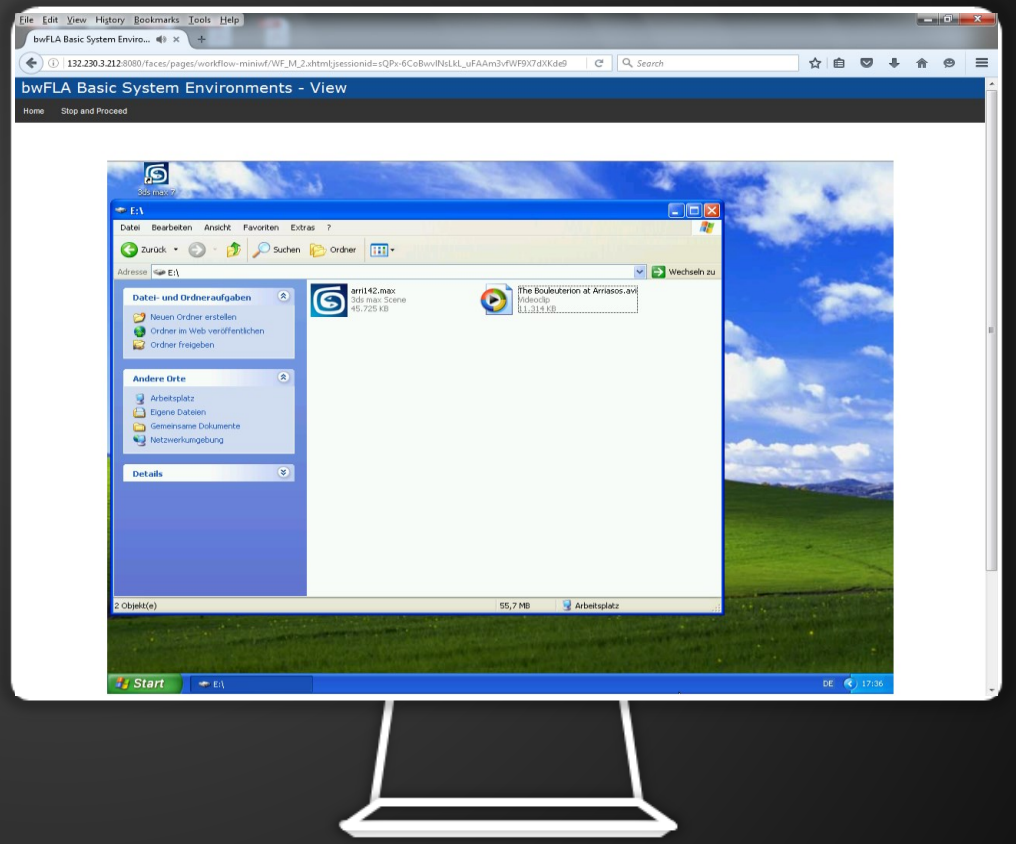
Rendering Case Study (5/8)

Rendering in progress



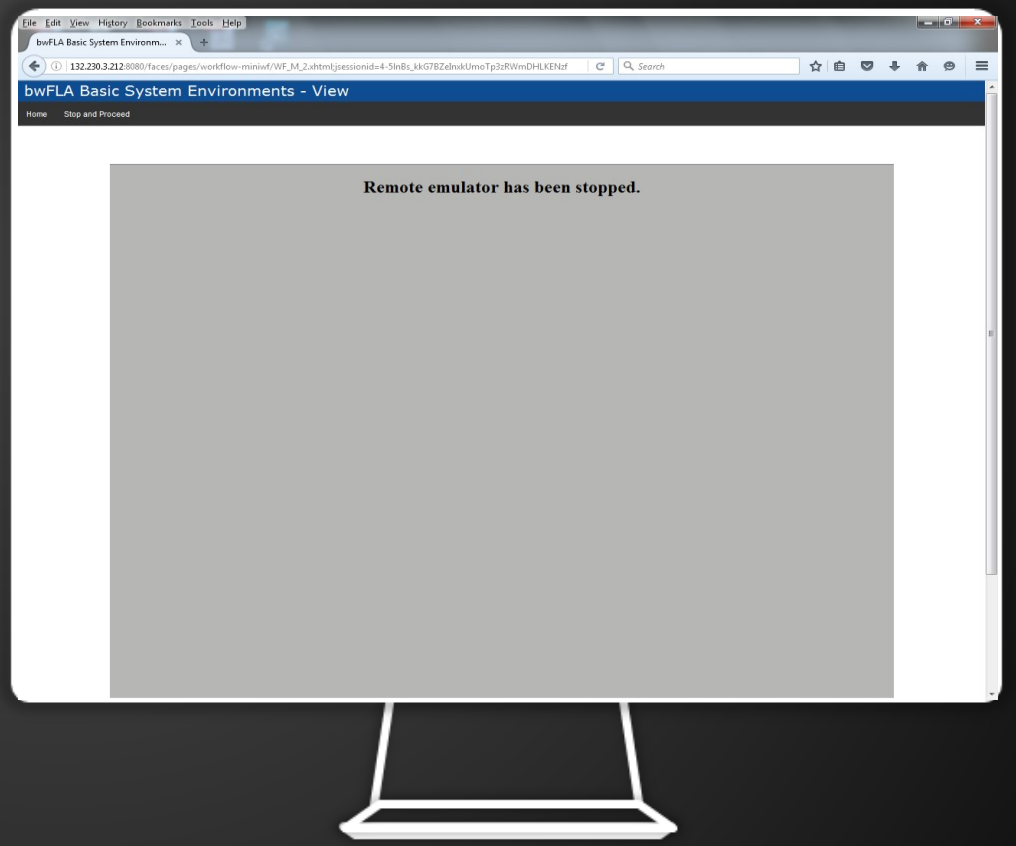
Rendering Case Study (6/8)

Click stop and proceed
to export files



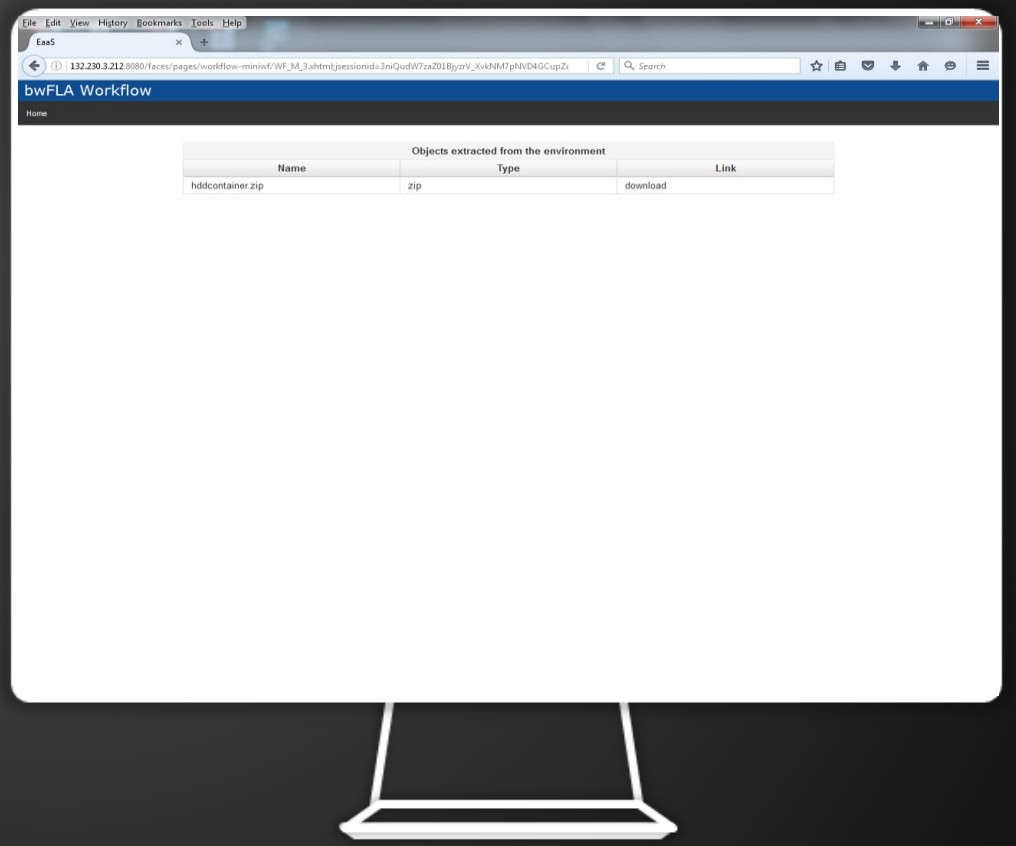
Rendering Case Study (7/8)

QEMU-KVM has been shut down



Rendering Case Study (8/8)

Download and unzip folder



Emulation Framework for Virtual Reconstructions

Evaluation Criteria

Renderability	• Accurate rendering of digital reconstructions. • Users need to identify the level of uncertainty about the final artefact.
Original Form	• Saving the original file in an open format conveniently supports its rendering in the original environment through emulation.
3D Object Relationships	• Including a virtual reconstruction's linked data into the 3D file itself allows for alternative reconstructions to be designed.
Views of the 3D Model	• Alternative reconstructions' 3D scene management permits an effective representation of the creative design process.
Attribute data associated with the 3D model	• Properties and materials
Relationships between data and the 3D model	• Animation and visual response
Interactivity	• Mouse and keyboard input/low latency
Messages	• Error
Audio	• Sound effects
Interaction aspects of the original GUI	• Export/print/save option/edit commands
Menu	• Help and guidance
(NEW) Chain of Custody	• The chain of custody of the data should start 'in the ground'. Every subsequent creative decision needs to be recorded as they change the original data into interpretation.
(NEW) Preservation Metadata	• The original data should be maintained alongside full documentation of the creative design process, ideally included in the 3D files themselves.
(NEW) Virtual Reconstruction Paradata	• For a virtual reconstruction to be valid, both its archaeological paradata and virtual reconstruction paradata needs to be associated.

The framework provides a practical starting point for memory institutions to make decisions about the long-term preservation of the archaeological virtual reconstructions, submitted to their collections. Each archaeological virtual reconstruction does not have to address all the proposed criteria to be archived, but the framework provides an understanding of what will be preserved, and perhaps an opportunity at ingestion to check with the depositor whether any additional missing metadata or ancillary files are available. It also hints at which points during the data lifecycle, the data producer could intervene and take a “preservation snapshot” of the data to be archived.

Thank you!

Do you have any questions?

Email: pap-pan@hotmail.com
Doctoral Thesis: 10.13140/RG.2.2.31913.67682