



# Complexities of Digital Preservation in a Virtual Reality Environment, the Case of Virtual Bethel

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# Digital Preservation of the Virtual Bethel

Over the last several years the Department of Library and Information Science has worked in conjunction with Media Arts and Sciences, and several other collaborators to create a Virtual Reality space for the Bethel Church, a prominent and important building in Indianapolis.

While the VR space has been created, the question now becomes how best do we preserve the virtual reality environment for potential future users?



# History and Importance of Bethel Church

- Founded in 1836
- Oldest African American church in Indianapolis
- Vital role in the Underground Railroad, the National Association for the Advancement of Colored People (NAACP) of Indiana, the first formal School for Black Children, and the development of the African Methodist Church in the US
- Oldest building on the Indianapolis Central Canal
- On the state and national historic registry



# Olivia McGee Lockhart – Church Historian

*“The Bethel church was a cornerstone of what took place in the city of Indianapolis... in the social life, the political life, and the economic life, it was part of the complete story... In terms of longevity and historical land-marking, I don’t think anyone can beat us.”*



# Bethel Church Archive and Recent Changes

- Extensive archive that spans over 162 years
- Artifacts document the rich history of the Bethel Church and the African American community in Indianapolis
- The physical church still exists, but was recently sold for 5 millions dollars and will become a hotel
- The congregation has moved to a new location



# History of the Virtual Bethel Project

- 2013 - the Bethel Archive came to the attention of the Department of Library and Information Science through a grassroots organization, whose mission was to promote digital preservation in the African American Community in Indianapolis
- 2016 - in collaboration with IUPUI University Library and the Indiana Historical Society funds were obtained through the Indiana State Library to digitize the archive
- Fall 2016 - funds were raised to pay a private company to complete a 3D scan of the church and hundreds of photographs were taken to document the interior of the church



# Creation of the Virtual Bethel

- Media Arts and Science faculty and students created the Virtual Bethel – the 3D Virtual space of the Bethel Church
- 2017 – team received funding to combine the digitized archive with the virtual sanctuary to create a learning space
- Creation of interactive vignettes to tell the story of the Bethel Church within the virtual environment



# VR Unique Preservation Challenges

- Nature of 3D data
- Complexity of the VR creation process and associated technologies
- Shares challenges of game preservation
  - Diversity of platforms used to run the environment and render the content for user experiences
  - Variety of media types, multi-layered data structure, and complexity of the relationships among the data
- Efforts made in preserving interactive digital and video games (McDonough, et al. 2010; Rhizome, 2018)
- Standards and best practices for these environments have not been reached (Kaltman, 2016)





# Multi-Level Preservation Evaluation Approach

- Defining Bethel Collection Boundaries
- Exploring Existing Preservation Workflow and Infrastructure
- Evaluating Library and Archival Approaches
  - Library (classification, item-level description)
  - Archival (arrangement, respect for original order, aggregate description)
- Utilizing the National Digital Stewardship Alliance – Levels of Digital Preservation
  - Preservation planning guidance



# Defining Collection Boundaries Evaluation

- Three distinct collections
  - Pre-production, production, and post-production (executable)
  - Relationships of the files both within and between the three phases
- Some files are reliant on each other for meaningful rendering by software
- Files are still being added to the collection
  - Project grew from 40GB to 60GB by the Spring of 2017 and continues to grow as more data is being added to create learning spaces in the environment



# Exploring Existing Preservation Workflow and Infrastructure

- No existing VR preservation workflow
- No existing VR policy
- No existing VR preservation infrastructure at SOIC or IUPUI University Library
- DSpace available through the School of Informatics and Computing (SOIC)
- Dspace available through the IUPUI University Library, Center for Digital Scholarship, which has two redundancies (access server and a dark archive server)



# Evaluating Library and Archival Approaches

## Archival Approach:

- Archival arrangement and descriptive
- Preserving all file formats in the original order
- Provides greater context, provenance, and respect for original order
- Intellectual access would be via a collection-level description, alongside contextual information documenting the creation process and software, hardware, and operating systems
- More effective and efficient

## Library Approach

- Classification and item-level description
- A digital library of catalogued objects
- A digital library of 30,000+ still images (jpeg), plus OBJ files and STL files was considered
- An OBJ file is a 3D file format used in graphics applications, and an STL file is a 3D file used in scanning and 3D imaging
- More time consuming given the overwhelming amount of digital objects



# Utilizing the National Digital Stewardship Alliance (NDSA)– Levels of Digital Preservation

- Provided framework for preservation recommendations
- Content and technology agnostic
- Provides guidance on five criteria: storage and geographic location, file fixity and data integrity, information security, metadata, and file formats
- Provided guidance for preliminary preservation actions for collection



# NDSA Preliminary Evaluation and Implementation

- 1. Storage and Geographic Location:**
  - Currently, the collection is in cloud storage (not long-term storage)
  - Project iterations are being evaluated to determine copy to DSpace for long-term preservation
- 2. File Fixity and Data Integrity:**
  - Currently, no fixity checks have been generated
  - Will be conducted prior to ingesting to DSpace
- 3. Information Security:**
  - Currently, only creation team has access to the files through the cloud storage service
  - Access rights are currently being determined
- 4. Metadata:**
  - Currently, administrative and technical metadata is being created
- 5. File Formats:**
  - An inventory of formats has been created



# Latest Developments For Preservation Plan

## 1. Capturing of Context

Workflow diagrams for each phase (pre-production, production, and post-production) has been created

Checklists for each phase has been created

Digital scanning documentation has been created

List of file formats and software needed have been created

Each area being thoroughly reviewed by the creation team to ensure accuracy



# Latest Developments For Preservation Plan, continued

## 2. File and Folder Inventory and Documentation

File Inventory including documentation of folder hierarchy

Since collection is still growing a preliminary inventory is currently underway, while ensuring flexibility for change

## 3. Interviews with Data Creators

To review documentation for administrative metadata and workflow diagrams for technical metadata

## 4. Dspace Implementation

Will be completed once documentation is completed

Exploring the ability to implement PREMIS through METS to include preservation metadata





# Limitations and Conclusion

1. Documentation is the current focus which will allow the team to take the next phase of preservation
2. The specific file types for virtual reality needs to be given further consideration as it is likely that file specific issues may occur and a plan to ensure that future users can access VR environment needs to be made concrete.
3. Files will initially be moved into the SOIC Dspace, however, there Dspace at the University Library, Center for Digital Scholarship may be another option to consider



# Special Thanks

- Indiana University's New Frontiers in the Arts and Humanities Program for their generous support
- The Bethel Community
- The SOIC Media Arts and Sciences faculty and students
- Indiana Historical Society, Indiana State Library, the Indiana State Museum, IUPUI University Library



# Thank you and questions



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