Variations on Video: Building the Next Generation Library Media Management System

IU Digital Library Program Brown Bag

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Presentation Outline

- Background, motivations, and project structure
- Technical architecture
- Development and requirements process
- Q&A
Background: Variations

- Open source digital music library system developed by IU DLP and Music Library
- In use at IU since 1996 (in various forms)
- Used at a dozen institutions, mainly for streaming audio course reserves
- @IU, current version online since 2005, now with ~20,000 digitized albums; in heavy daily use
Variations beyond IU

Open source at variations.sourceforge.net since 2009 thanks to IMLS National Leadership Grant

Indiana University
Tri-Colleges
(Haverford, Swarthmore, Bryn Mawr)
Ohio State University
University of Maryland
New England Conservatory
Dartmouth College
University of Miami
Baylor University
Southern Methodist University

University of North Texas
Bowling Green State University
Oberlin College
University of Connecticut
Kenyon College
Calvin College
New York University
Yale University
Youngstown State University
Variations on Video

- Planning grant from IMLS
  - $50,000 National Leadership Grant
  - August 2010 – June 2011

- Implementation grant from IMLS
  - $948K National Leadership Grant
  - October 2011 – September 2014

- Partnership with Northwestern University + others
Project Objectives

- Develop a digital audio/video management and delivery system, focused on needs of libraries and archives
- Follow an agile, open source development model
- Leverage existing technologies, where feasible
- Communicate and market the project broadly to increase awareness and grow the community of users and developers
Motivators

- Demand from Variations implementers and other institutions
- Increased video digitization and creation at IU
- IU Media Preservation Initiative
- IU IT strategic plan: *Empowering People*
- No existing system serves needs of libraries
- History of involvement in open and community source software
- Desire to create a sustainable foundation for Variations development and maintenance
What needs are we trying to serve?

- Libraries and archives (and museums?)
- Wide variety of audio/video collections, uses, and access needs
  - Licensed educational video collections
  - Video/audio e-reserves
  - Archival collections
  - Open access collections
- Research and teaching & learning use
- Long-term management and access
- Tie-in with preservation
Variations on Video: Content

- Video digitized from library collections
- Files with purchased or licensed streaming rights
- University produced video
- Archival collections
- Faculty-produced video
Variations on Video: Scope

- Access to managed collections
  - Video, audio
  - Focus on libraries, archives
  - Research, teaching, and learning use
  - Variety of access control requirements
  - Integration with preservation repository services

- Ad-hoc faculty/student uploads
- Classroom capture
- Live streaming
- Working digital assets – media production
Existing Solutions Insufficient

- Institutional and digital library repositories
  - e.g. DSpace, Fedora, Digital Commons, ContentDM
- Web video services
  - e.g. YouTube, Vimeo
- Streaming servers
  - e.g. Flash Media Server, Real Helix, Wowza, Red5
- Classroom lecture capture
  - e.g. Echo360, Mediasite, Opencast Matterhorn
- Digital asset management systems
  - e.g. OpenText, NetXposure
- Online video environments
  - e.g. Kaltura, Brightcove
Basic Functionality

- Video file upload/ingestion
- Transcoding
- Descriptive metadata entry / bulk upload
- Basic structural metadata
- Discovery
- Delivery and navigation
- Reuse
Results of Planning Process

- More interest out there than we had thought
- Focus on ingest, management and delivery rather than on sophisticated analysis and annotation, at least initially
- A modular approach is required
- Investigation of opportunities to leverage work of other projects where possible, such as Fedora, Hydra, and Opencast Matterhorn
Project Partners and Collaborators
Current Status

- Grant received October 2011
- Hiring staff at IU and Northwestern
  - Phuong Dinh hired at IU in January
  - One more developer to be added at IU and one at Northwestern
- Re-engaging partners
- Putting development and communication processes in place
- Technical investigations
- User story development
Architecture

- Hydra Framework
- Opencast Matterhorn
- Streaming Server
Hydra Framework

Hydra Architecture

Hydra Rails Plugin (CUD)  Blacklight (R)

Fedora  Solrizer  Solr

http://projecthydra.org
Opencast Matterhorn

Lecture Capture & Administration

Ingest & Processing

Distribution Management

Engage Tools

http://opencast.org/matterhorn/
Architecture Revisited

- Hydra Framework
  - Search for free
  - Rich toolset for quick development
  - “One body, many heads”

- Opencast Matterhorn
  - Flexible processing pipeline
  - Highly modular

- Streaming Server
  - Red5 – open source and support in Matterhorn
  - Flash Media Server – popular and iOS support
VoV Development Process

- Open
- Agile
- Distributed
- User-centered
- Product to be released with an open source license
- Transparent planning, prioritization & development (beyond IU & NU)
- Partnerships with other open source efforts such as Fedora, Hydra, and Opencast Matterhorn
- Product success will attract third-party for-fee support providers
- May integrate with commercial products such as the Flash Media Server, but will also provide fully free options (e.g., Red5)
- Rapid iterations & frequent releases
- Agile Scrum
  - Daily scrum meeting
  - Releases are time-boxed “sprints”
  - Requirements replaced by user stories prioritized by product owner
  - Stakeholders review each sprint
- Scrum training planned

Source: VersionOne, Inc. (CC)
Distributed

- Development primarily expected to occur at Indiana and Northwestern
- Other partners will install and test, providing feedback and participating beyond that if desired
- Northwestern has experience with Scrum, but doing it between two development sites will be new
- Will make heavy use of videoconferencing, Adobe Connect, IRC, etc.
- Occasional F2F meetings
User-Centered

- User stories won’t be pulled out of the air—based on planning grant work
  - Significant needs analysis via interviews and observations
  - Collected usage scenarios from other institutions
  - Teams of stakeholders from IU and NU will be meeting to generate user stories
- Sprints will be publicly available for institutions to test with their own users
User Stories

Structure: As a <role>, I want <to do something> so that <result>.

Acceptance test: “Done” looks like <test>.

Example

As an instructor, I want to preview items in the archive so that I can make sure it is the version I want students to see. “Done” looks like: instructors have viewing access to already digitized videos.
For more information

- [http://www.variationsonvideo.org](http://www.variationsonvideo.org)
- Join [vov-l@listserv.indiana.edu](mailto:vov-l@listserv.indiana.edu)
- @varvideo
- [http://www.facebook.com/varvideo](http://www.facebook.com/varvideo)
QUESTIONS?