Digital Libraries for Information Sharing for Education and Training

By Dr. Vinod Chachra

(VTLS Inc)

Day 1: 8th April 2014

Session I

Overview of National and International Digital Library Initiatives
Vinod Chachra, PhD, serves as President & CEO of VTLS Inc. in Blacksburg, VA. VTLS provides ILS, Institutional Repositories and RFID solutions to libraries in more than 2100 libraries in 43 countries. Vinod Chachra is an internationally recognized lecturer and consultant in the field of information system planning. Chachra has been active in the library profession for more than 30 years. Chachra was the chief consultant for the National Center for Higher Education Management Systems (NCHEMS) and OCLC. He served on the Board of Directors of many organizations including NISO (National Information Standards Organization), CAUSE, EDD and RBTC. After earning his Ph.D. in industrial engineering and operations research at Virginia Tech, Dr. Chachra served that university in many capacities most recently as Vice President Computing and Information Systems which included Computing, Software Development and University Libraries. In 2012 Chachra was inducted as a founding member of the Virginia Tech Faculty Entrepreneur Hall of Fame. In 2013 VTLS Inc. was inducted into the RBTC Technology Hall of Fame. Chachra has written two books, a chapter in a third book, and numerous journal articles.
International Digital Library Conference 2014
8 - 10 April 2014, Kuala Lumpur, Malaysia

Digital Libraries for information sharing
for Education and Training

Dr. Vinod Chachra
President & CEO VTLS Inc.
8 April 2014

VTLS HQ in Blacksburg, VA, USA

After a hard winter
Spring is finally here
Presentation Concepts

1. There is more to Digital Asset Management System than just storing and rendering digital assets
2. Streaming Media (Video and Audio) will play an increasing role in teaching and learning. Therefore it will be important to libraries.
3. Linked data will be the essential facilitating technology for future information access (digital and physical)
4. Mobile devices will be the preferred (if not the only) tool for information access.

Presentation Outline

Part 1: Brief Introduction to VTLS
Part 2: VCOM TV (using streaming media)
Virginia College of Osteopathic Medicine TV
Part 3: VITAL Digital Asset Management System Capabilities
Part 4: Linked Data
   a. KCPL - Civil War Web Site using linked data
   b. Bibframe, linked data and next generation catalogs
Part 5: Future -- Open Skies
Part 1: VTLS Today

VTLS is a leading global provider of visionary library software solutions to over 2,200 libraries in 43 countries. There are more than 70 libraries in Malaysia using VTLS software.

VTLS has vast experience in meeting the needs of public, academic and national libraries as well as specialized information centers around the world.

Currently six offices located strategically around the globe.
- All software development takes place in Blacksburg, VA.
- Regional Offices provide expertise in their geographic areas.

VTLS Today

VTLS Global Offices

VTLS Americas
(Blacksburg, VA)

VTLS Europe S.L.
(Barcelona, Spain)

VTLS Malaysia
(Kuala Lumpur)

VTLS Australia
(Melbourne, Australia)

VTLS India*
(New Delhi, India)

Part 2: VTLS Culture

A culture of excellence drives VTLS’ success and unrivaled customer service has led to the best customer retention rates in the industry.

- Being one of, if not the only ISO 9001 certified software companies within the library technology industry has led to quality products with high customer satisfaction and fewer complaints.

VTLS is positioned as a leading player in the global library automation software industry.

- VTLS has won significant contracts recently (e.g. the Hong Kong Public Library, Queens Public Library and Library of Congress) against much larger companies.

VTLS’ business solutions and software engineering expertise wins business by tackling complicated library problems.
VTLS -- Long Term Partnerships


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UPM celebrates their 25 year partnership with VTLS in 2013. VTLS user since 1988.
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Part 1: VCOM TV -- Using Digital Libraries and “Multi-channel, On-demand” Streaming Media for Effective Teaching and Learning (VCOM TV)
The Edward Via College of Osteopathic Medicine in Blacksburg, Virginia is a four-year osteopathic medical school offering the degree of Doctor of Osteopathic Medicine (D.O.).

**The MISSION of the Edward Via College of Osteopathic Medicine (VCOM) is to prepare globally minded, community-focused physicians for the rural and medically underserved areas of Virginia, North Carolina, South Carolina and the Appalachian Region, and to improve human health especially of those most in need.**

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**About VCOM**

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**Necessity is the Mother of Invention**

- VCOM medical students were frequently on rotation to hospitals and many were unable to be on campus and attend the lectures.
- VCOM needed a way to reach these students without incurring tremendous costs in time and money.
- What started out as a method for reaching students on rotation has now turned into a very effective teaching tool for faculty and learning tool for all students, even those not on hospital rotations. The program is called VCOM-TV.
The VCOM TV Solution

VCOM met this particular requirement by:
- recording classroom lectures in rich media format (dual stream video)
- synchronizing the lectures with presentation slides,
- producing streaming video of the synchronized content, and
- making these videos searchable and available on-demand via the web.

VTLS provided the technology and service.

The Birth of VCOM TV

- The program started in 2010
- The Via College of Osteopathic Medicine (VCOM) in Blacksburg, Virginia, embarked on a program (now called VCOM-TV) to create an effective teaching and learning environment for their students.
  - the content increased from under 100 videos to over 6,000 videos within four years
  - usage increased exponentially
The creation process uses a multi-channel, video recording system. Whereas the system supports more than two channels – only two are used.

- One channel shows the faculty member and the other shows a PowerPoint (or any other activity - like lab experiments).
- These channels are automatically synchronized, which allows students to "jump" around in the content from either channel as needed. It lets students navigate and review small portions of a lecture (for exam preparation) from anywhere using a standard browser.
The Creation Process

- In addition to being a consistent teaching tool, the system is an effective learning tool.
- It lets students navigate and review small portions of a lecture (for exam preparation) from anywhere using a standard browser.
- Except for the lecture preparation itself (which the faculty has to do anyway), the creation process is simple and, after the first time, can be handled by the faculty member without any outside help.
- An operator loads the data into the institutional repository.

Creation Process - Recording Options

There are three options available for recording:

1. Live in the classroom
2. Pre-recorded in a studio (controlled environment)
3. Pre-recorded using portable studio
   - This can be taken to a lab or an operation room

- The first two options can be self-service
- The third option requires operator assistance.
- VCOM does all its own recordings
**Creation Process - Portable Studio**

Components:
1. Back Drop
2. Light Source
3. First Channel: Camera
4. Second Channel: Laptop
5. Synchronizer & Recorder

All this will be packaged on a single cart.

This is a very simple layout of the Components shown in the list. Most recordings can be done by the instructor.

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**Content Management**

- The management Process is simple
  - Once the recording is complete there is a possibility of editing the content. This step is optional.
  - Created content is loaded into the VITAL repository and a metadata record created. This makes the content immediately available to the users.
  - Only the content (not the metadata) is loaded to the cloud based streaming service provider.
  - Google analytics are setup to monitor usage.
  - The normal VITAL/Fedora backup-recovery-version control features are invoked.
The Delivery Process

- The technology used to deliver the solution is not complex.
- Users access VCOMTV repository
- Authenticate themselves
  - Based on their authentication they are allowed to see certain collections
- Search the repository and select the desired content
- View and navigate content from a cloud-based streaming system using their standard browser.
VCOMTV - VITAL & Cloud Based Streaming

The VTLS VITAL Architecture

For Example see VCOM-TV

Result: Tremendous Growth (1 of 4)

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www.vtls.co
Result: Tremendous Growth (4 of 4)

Total Hours of Videos Watched

Note: December 2013 data goes through December 16, 2013

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What does VI TAL do?

Provides Management Services
- Ingest - XML-encoded object submission
- Create - interactive object creation via API request
- Maintain - interactive object modification via API requests
- Validate - application of integrity rules to objects
- Identify - generate unique object identifiers
- Secure - authentication and access control
- Preserve - automatic content versioning and audit trail
- Export - XML-encoded object formats

Provides tools to simplify the workflows

VI TAL Feature List - Discovery Portal

1. Robust searching and browsing functionality including browsing content
2. Support for facets to refine searches
3. Pre-defined search targets
4. Support for most popular and library highlighted content
5. Highlighted authors
6. Integrated RSS feed
7. Hi-Resolution Image Navigation Configurable displays for search results
8. Page Turning Interface
9. Enhanced displays for EAD, DC and MARC metadata
10. Handles Server is integrated for support of persistent identifiers
11. Google Indexing and Exposure to other Harvesters
12. SRU Interface for exposure of repository content
13. Support for Content Models
14. Language support & UNICODE compliance
15. OpenURL Support
16. Citation Export
17. Relationship Browser
18. Support for thumbnail display
19. Support for viewing content in external applications
20. Fully customizable interface design
1. Support for PREMIS preservation metadata
2. XML Validation
3. Metadata Synchronization
4. Automatic Authority Control
5. Administrative Reporting including Access and Usage Statistics
6. Consortia Support
7. Automated verification of linked resources
8. User Activity Logging Global Diagnostics Page
9. Repository Indexing and custom indexes to enhance resource discovery
10. Annotation of page content
11. User Authentication via LDAP and Shibboleth

Content Creation and Modification Features

1. Support for any content type in its native format
2. Relationships Management
3. Previewing content directly from VITAL Viewing, Editing and Saving content directly from VITAL
4. Editing XML content in your preferred interface
5. QuickEdit XML
6. Tracking content changes through versioning
7. Automated capture of technical metadata for preservation purposes
8. Automated text capture for full-text searching
9. Automatic validation of content via JHOVE
10. Support for PREMIS preservation metadata
### Batch Ingest Utility

1. Flexible definition of ingest source targets
2. File extension and filename filtering
3. Ingest content interpreted/derived from a source target
4. Ingest output from executable program
5. Metadata mapping

### Auto Loading & Electronic Submission Tool

1. Templates for electronic theses and dissertations
2. Other templates for various content types
3. Configurable workflows
4. Configurable, staged content aggregation
5. Automatic metadata transformation for any XML schema
6. Automatic assignment of Handles (persistent identifiers)
7. Automatically extract full-text for PDF content
8. Pop-up Help windows
Summary - VTLS VITAL Media Solution

- The VTLS VITAL Media solution developed for this project is based on Fedora™ and VITAL. Fedora is an open source institutional repository. VITAL is an enhanced version of Fedora with a variety of workflows and system management capabilities.  
- VCOM's VITAL repository is used to store the content in small collections and provide discovery and authentication tools.  
- When students log on, they are authenticated as first-year, second-year, or third-year medical students and gain access to the appropriate sets of videos.  
- The solution supports searching and discovery by means of topic, date, instructor, and many other user-defined facets.  
- The videos are delivered on-demand using the VITAL Media Cloud option.  
- Content can also be delivered using local streaming media resources.

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BibFrame Model - Work and Instance


BibFrame -- Annotation Framework

BibFrame Model extends the vision

The Bibframe model allows linked content on the web to seamlessly become a part of the available data package for the user.

How do you navigate this linked data?

Figure 8: Theme based Linking Open Data cloud diagram. by Richard Cyganiak and Anja Jentzsch. http://choli.hut.fi/
How do you navigate this linked data?

Answer: You break it up into parts – see next slide
Viewing an “instance” record

Viewing another “instance”
Annotation Body - Reading Group Guide

The Lord of the Rings
by J.R.R. Tolkien

One thing to note about these books is that they are not a part of a series. They are, however, a part of a larger narrative. The story begins with the hobbits Frodo and Samwise, who are tasked with destroying the One Ring, a powerful object that can destroy Middle-earth. Along the way, they encounter various creatures and face many challenges. The story is told from multiple perspectives and ends with the destruction of the Ring.

Navigation in Visual Browser

Demonstration of Link Data Navigation
In a Library Catalog

http://Cheetah.vtls.com:9977
Example - KCPL Relationship Browser

Showing relationships for James Henry with People, Events, Groups, Locations.

Link Data Navigation (KCPL)

Set has 3 pages; Pages 1 and 2 are shown; navigation buttons in red.
The Relationship Browser
When viewing many of the documents in the digital collection, you will see a relationship graphic beneath the item information. This links to an innovative feature that facilitates effortless exploration of the thousands of documents that are digitized on the site.

The relationship browser allows you to view connections among people, places, groups, and events – connections that are proven by the various documents in our collection and that reveal how people were acquainted, where they lived and fought, their political and military adversaries, and what they accomplished during the border war period.

To change your perspective and reveal other connections, simply click on any of the hexagonal nodes in the relationship browser:

From KCPL Civil War Web Site developed by VTLS
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What is Open Skies?

- Open Skies is a new platform which unifies the management, storage and delivery of print and electronic content, streaming media, internal and external content and more.

- Three key trends driving Open Skies initiative:
  - Rapid transitions in libraries from print to electronic media.
  - Increasing use of streaming services for education and training.
  - Phenomenal growth and sophistication of mobile devices.

- Four separate goals being targeted to help users:
  - Present a single system image to the user.
  - Present a single user interface for all access.
  - Create a plug-and-play environment to allow for simple or complex work flows and the integration of different software or service solutions.
  - Provide a unique navigation and visualization tool.

Open Skies Layer 1

Diagram shows a single user access point for all information including external and internal information and licensed and free data.
Layer 2 is the services layer which interacts with each of the elements in layer 1. As new services are added, they become immediately available to all information types.

The storage and data layer allows data to be stored on single and multiple machines and at one or more locations distributed around the globe.