Using Institutional Repositories and Multi-channel On-demand Streaming Media for Effective Teaching and Learning (VCOMTV)

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VTLS HQ in Blacksburg, VA, USA

About VCOM and VTLS Partnership

VCOM (The Edward Via College of Osteopathic Medicine) and VTLS launched a program called VCOMTV. The program has been extremely successful. This presentation describes the different aspects of the program.

- VTLS World Headquarters are located in Blacksburg, VA in a beautiful 32,500 square foot facility located at the Corporate Research Center (CRC) at Virginia Tech.
- VTLS was the first tenant at CRC
- VTLS employs
  - 80 FTE in Blacksburg;
  - 120 FTE worldwide.
- VTLS is celebrating its 25th Year
- This project (VCOMTV) is a joint partnership project of VCOM and VTLS

About VCOM

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.

About VTLS Inc.

VTLS is the first spin-off corporation from Virginia Tech.

VTLS is an international company doing business in more than 40 countries.

VTLS has offices/wholly owned subsidiaries in 7 countries.

VTLS has four major products

Virtua: Integrated Library System

VITAL: Institutional Repository Software (used in VCOMTV)

Visualizer: Discovery tool for distributed content (Now Chivas)

VTRAX: RFID based tracking & security systems for libraries

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.

Presentation Outline

This presentation will discuss VCOMTV

1. Birth of VCOM-TV
2. Content Creation (self service focus)
3. Content Management Using Fedora and VITAL
4. Content Delivery Using Cloud Computing

The entire process has three simple objectives:

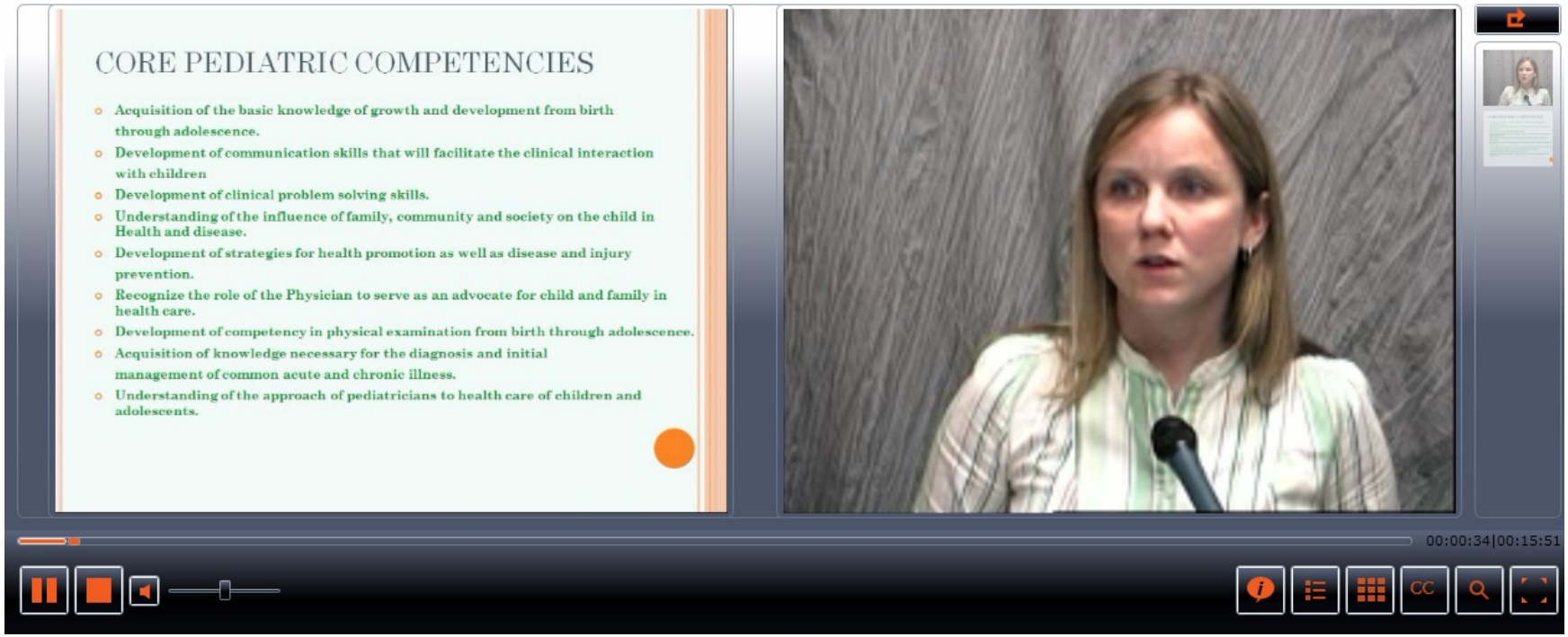
1. Promote self-service
2. Control costs, and
3. Increase levels of service

Will add fourth objective – quality management.

The Birth of VCOM *TV*

- The program started one year ago
- 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.
- Within the year
  - the content increased tenfold and
  - usage increased 800-fold.
  - More than 1,000 different lectures are now available.

An example of VCOM *TV* recording



Play-stop-volume Controls

Navigation Controls

The Creation Process

- 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 class room
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

There is a setup in the back of the room

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.

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.

What does VITAL do?

Provides Management Services

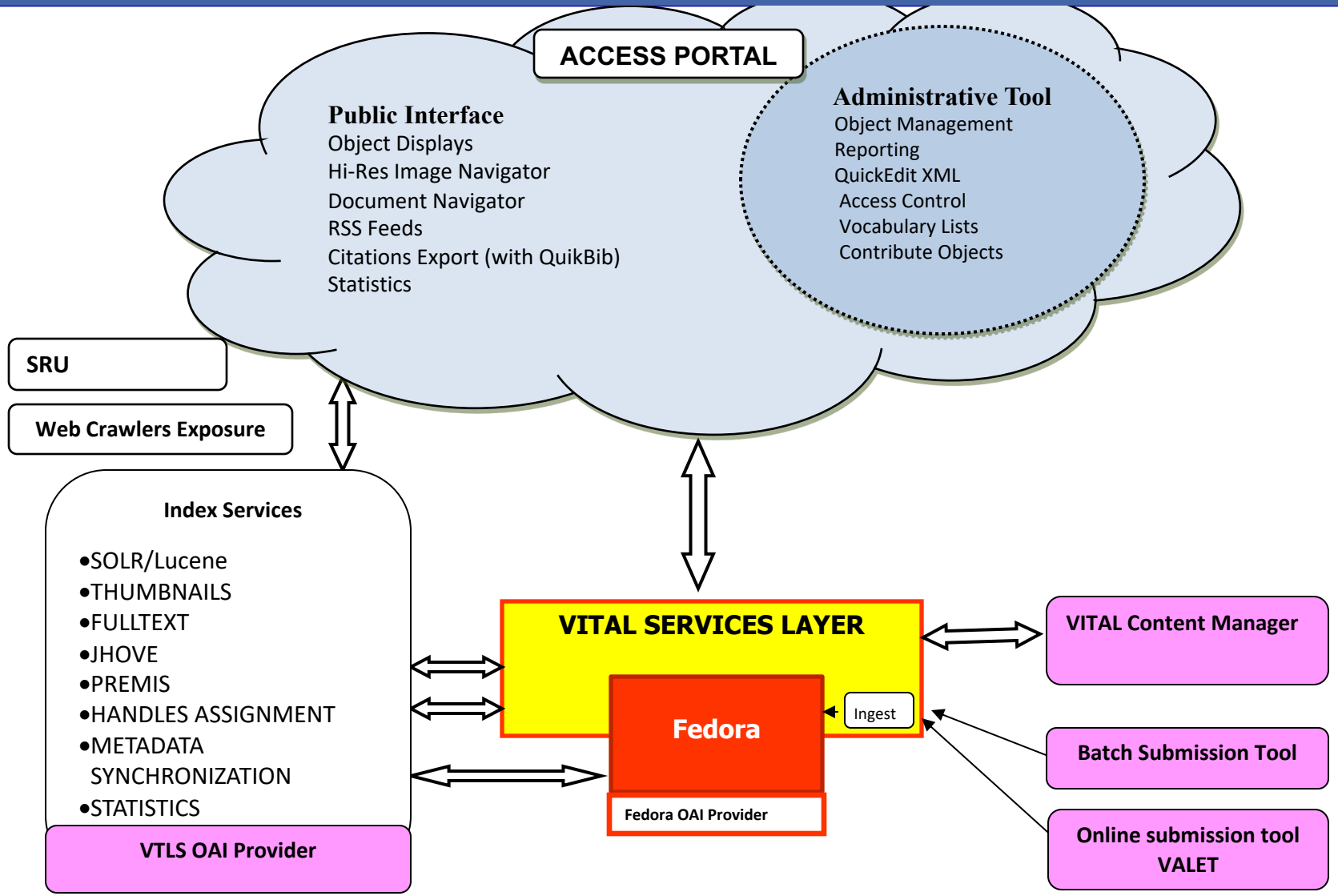
- Ingest – XML-encoded object submission
- Create – interactive object creation via API request
- Maintain – interactive object modification via API requests
- Validate – application of integrity rules to objects
- Identify – generate unique object identifiers
- Secure – authentication and access control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

Provides tools to simplify the workflows

Why VITAL?

- It manages the digital assets of the library
- It provides easy workflows for creating digital content
- It supports cloud computing and cloud based streaming
- It is based on open source and extensible infrastructure of Fedora
- It has a worldwide user base.
- VCOM was already using VITAL

The VTLS VITAL Architecture using Fedora



The Delivery Process

- The technology used to deliver the solution is not complex.
- Users access VCOMTV the 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.

Change Year

GlobalView
Submit

Repository

Show All 96

Show Quick Collection 0

Search Advanced Search

Search

Show Public Objects

Browse

Communities & Collections

By Title

By Creator

By Subject

Highlights

Most Accessed Items

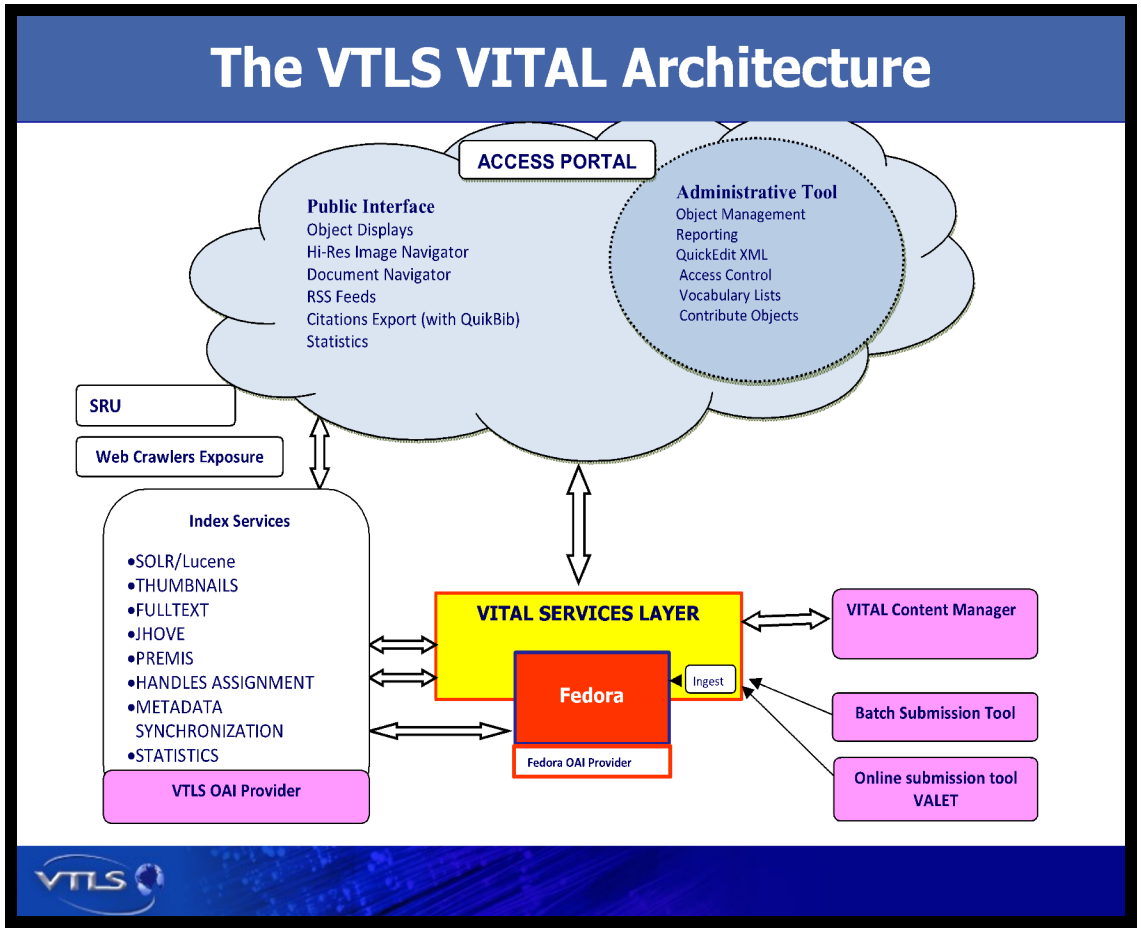
Most Accessed Authors

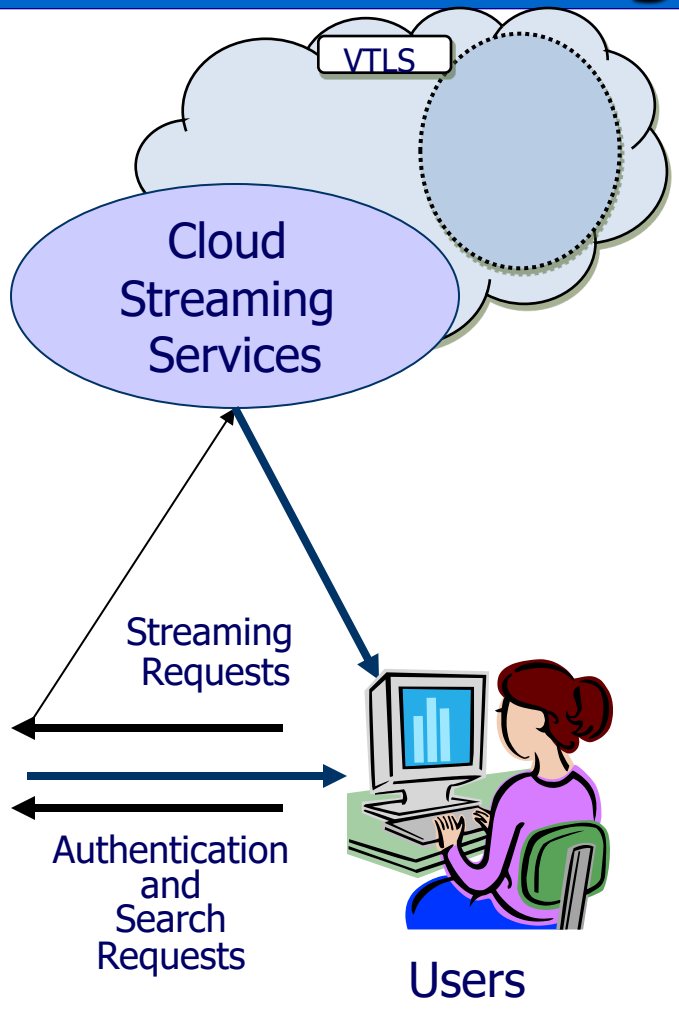
Showing items 1 – 15 of 96.

First Previous | 1 2 3 4 5 6 7 | Next Last

	Title	Creator
⊕	Newborn Exam	Breann Bailey, MD, FAAP
⊕	Age–Related Macular Degeneration, Glaucoma & Cataracts	Richard T. Williams, M.D.
⊕	Anti–Aging Medicine	Richard T. Williams, M.D.
⊕	Neurology Review	Dr. Zhang
⊕	Approach to Abdominal Pain	Ted N. Georges, M.D.
⊕	Basic Approach to a Trauma Patient	Ted N. Georges, M.D.
⊕	Intro to Respiratory Therapy	Ted N. Georges, M.D.
⊕	Mechanical Ventilation: Death Rides a Pale Horse	Ted N. Georges, M.D.
⊕	Acute Renal Failure	Peter J. Recupero, D.O.
⊕	Welcome to Psychiatry	Brian E. Wood, DO
⊕	Introduction to Internal Medicine	John M. Kauffman, Jr., DO
⊕	Osteopathic Considerations for the Shoulder	Sarah M.G. McGinley Turner, D.O.
⊕	Underserved Care as a Career	Linda Frasca, M.D.
⊕	Welcome to General Surgery	Kenneth D'Amato, DO

VCOMTV – VITAL & Cloud Based Streaming



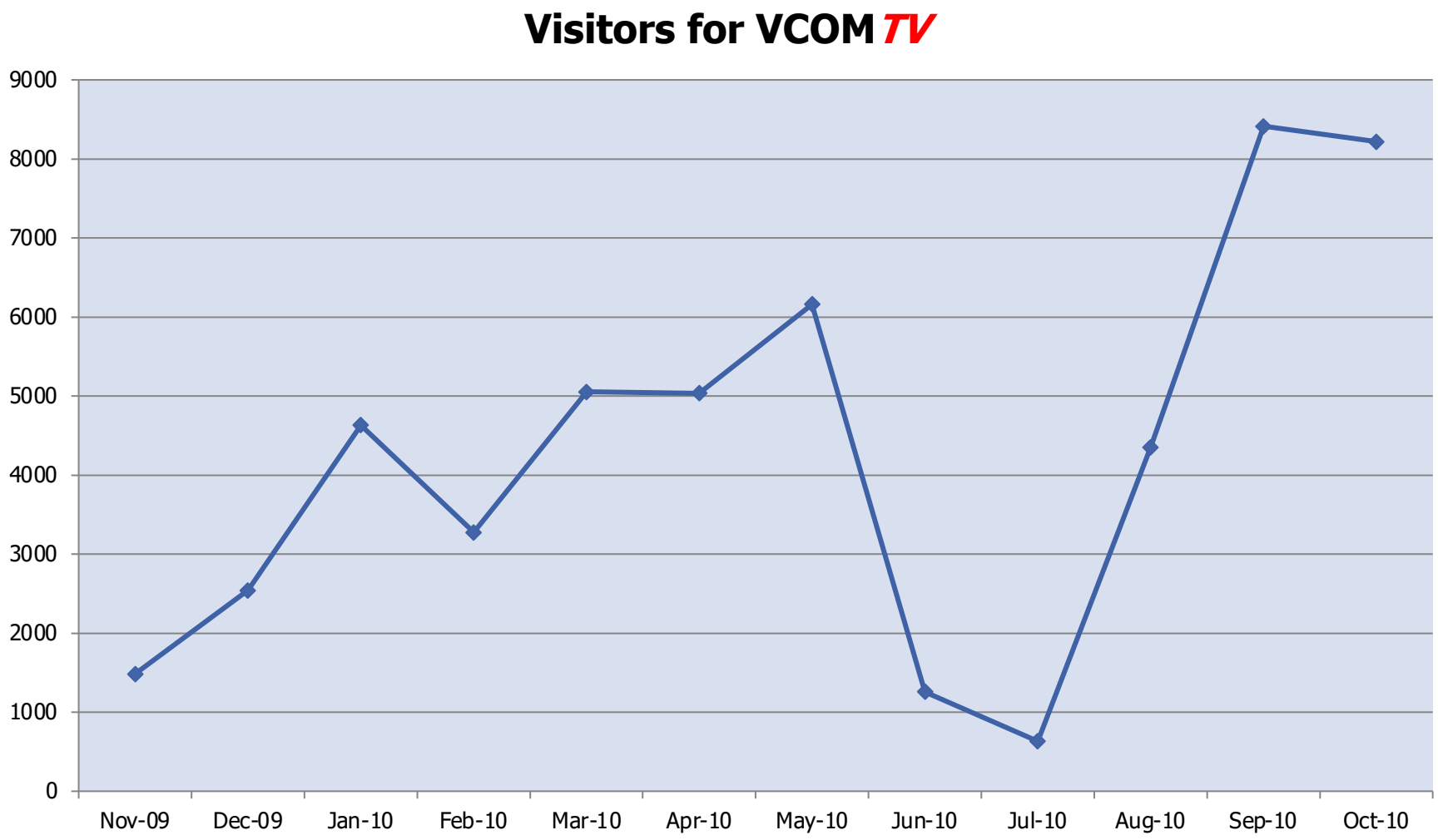


For Example see VCOM-TV

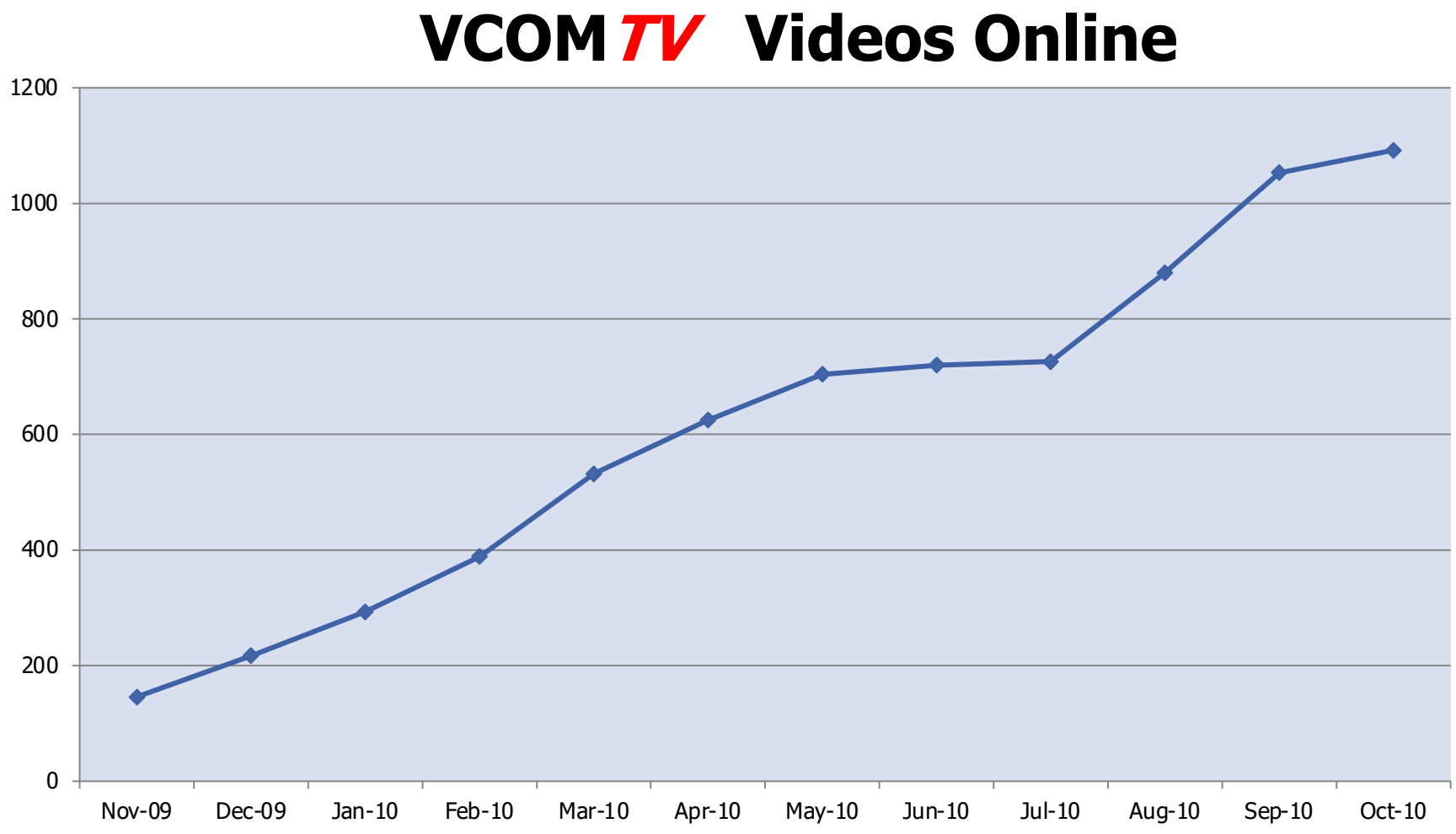
Result : Tremendous Growth

- The success of the program can be judged by the exceptional growth in the usage as shown below.
- In one year
  - The number of videos has gone from 142 to 1,100
  - The bandwidth usage has grown from almost nothing to over 2,200 GB per month.
  - The number of visitors has increased to more than 8,000 per month.
- Charts follow

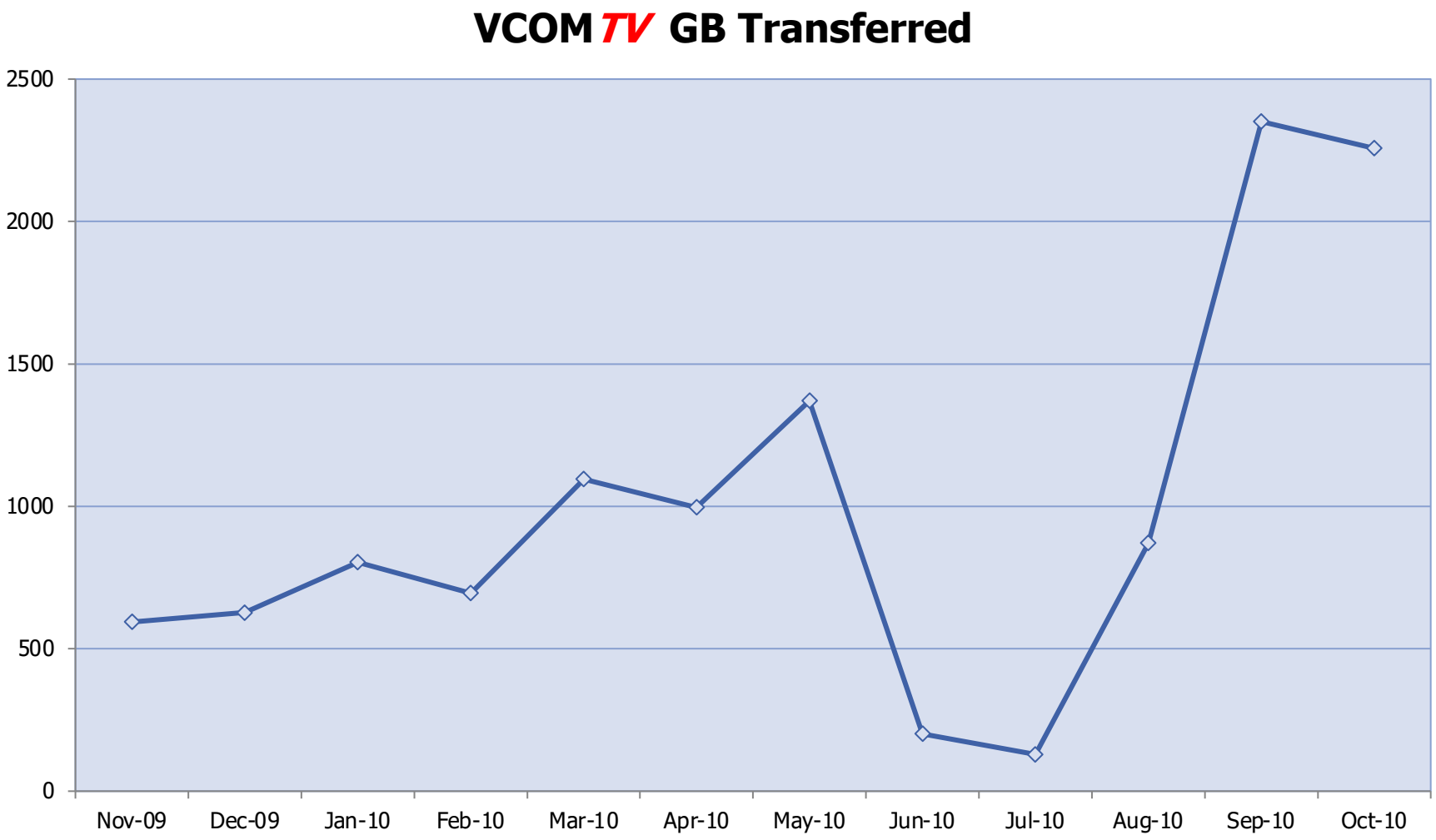
Result : Tremendous Growth (1 of 3)



Result : Tremendous Growth (2 of 3)



Result : Tremendous Growth (3 of 3)



Questions to address (1)

- How do we measure the effectiveness of this delivery mechanism over traditional means?
- Do the students prefer this format to traditional means…
  - For full lectures?
  - For exam preparations?
- Is it better for students to take class notes (as an aid to concentration), or is it better for them to simply listen to the lecture knowing that they can review it later?

Questions to address (2)

- Is it better to record the videos live in the classroom or prerecord them in the studio?
- Should the faculty members stop lecturing in the classrooms and instead require the students to listen to the lecture before they come to class and use the class time for discussions?
- When will these recorded lectures become obsolete? When should they be re-recorded? In short, what is the "life" of a typical recording?

Questions to address (3)

- What other features are required to make the process simpler?
- What additional software features can make this system totally self-driven by faculty?
- How to change the program when the new campus opens in South Carolina next year?
- Other questions:
  - Should we be recording dissertation defenses? If so, should we attach them to the ETDs?
  - Can this system be used for lab work?
  - Would this system be effective for safety training?

Still other Questions?

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Moving the Project Forward

- Create a dependable self recording environment for
  - The classroom
  - The recording studio
  - Portable studio
- Instruct faculty on effective recording practices
  - Prepare, prepare, prepare
  - Stay within the camera view
  - Control the recording process while lecturing
  - Repeat the questions
- Package the portable studio
- Develop a pay-for-view option for non-students and professionals
- Record lectures that
  - More than 3 years old
  - Have questionable quality
  - Are delivered offsite.
- Package solution so that others can use it -- VITAL Media Solution

Summary - V*TLS 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.

Thoughts - V*TLS VITAL Media* Solution

- At present Vital Media provides the turnkey solution (create, manage, deliver). Should it provide single aspects of the solution?
  - Just the creation hardware / software
  - Just VITAL for management if a campus already has its content. VITAL is a flexible digital content management tool and is already used several institutions
  - Just hosted services for delivery of the content

Thanks … Our success lies in making you successful

Questions?