

VClass: e-learning application

TOPICS

- ❖ Virtual Classroom (VClass)
- ❖ Objectives
- ❖ History
- ❖ VClass Components
- ❖ Learning Environments in VClass
- ❖ Examples usage:
 - CanalAVIST – Virtual Education Project of Pakistan
 - UniChannel Project

Virtual Class (VClass)

A royalty-free e-learning application developed by Distributed Education Center, a subunit of Internet Education and Research Laboratory (intERLab) at AIT.

Virtual Class (VClass)

Specifically designed for delivering online course by three different methods: virtual classroom learning, virtual class-on-schedule and virtual class-on-demand.

- Virtual classroom learning : *Real-time lectures*
- Virtual Class-on-schedule : *Archived lectures*
- Virtual Class-on-demand : *Archived lectures*

Objectives

- ❑ Simple (to operate) yet provide useful functions for e-learning process.
- ❑ Low-cost
 - Open-source components
 - Platform-independent
- ❑ Standard in controlling and managing courseware
 - Sharable and Re-usable contents

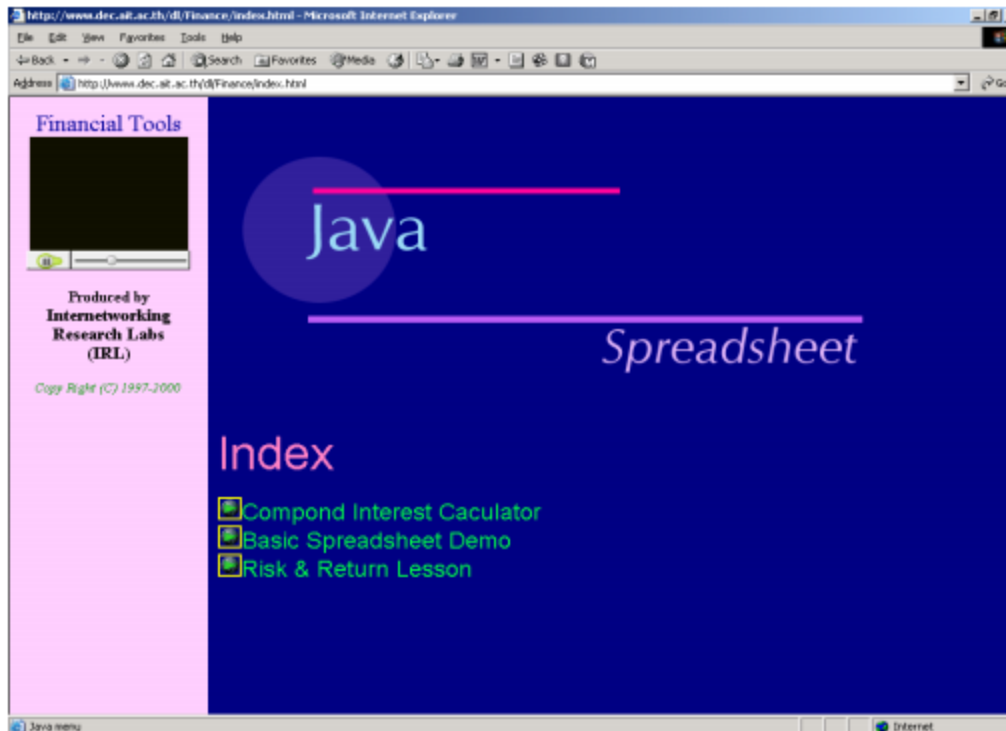
History

1998

Royal Thai Government contributed 3.3 million baht to AIT for test trials and dissemination of Institute's first open source e-learning software for organization based human resource development.

1998-1999

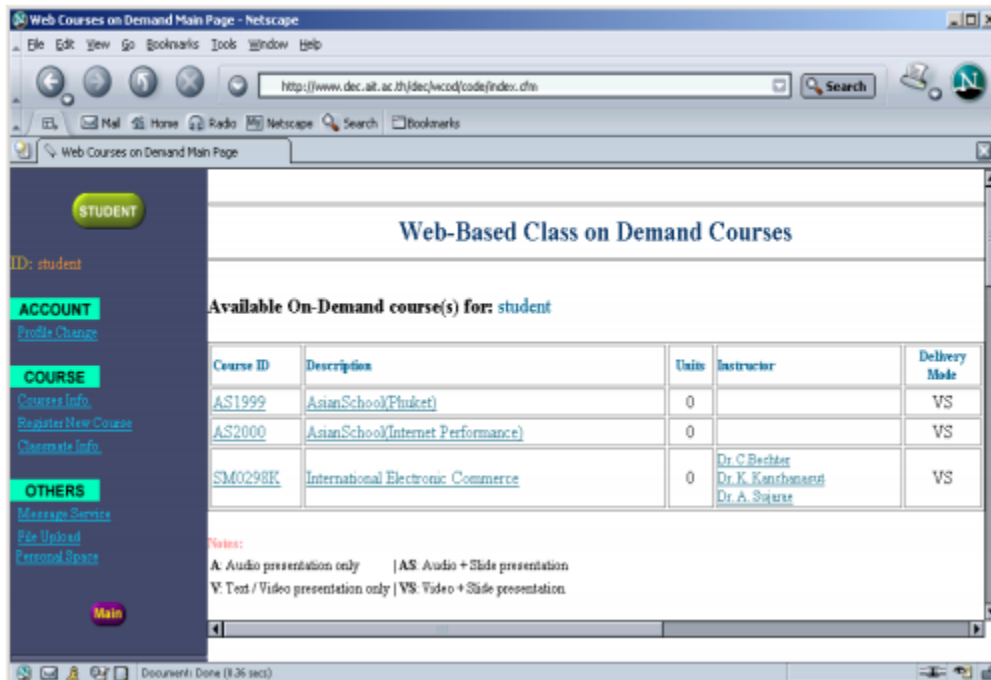
Experimenting on Video on-demand contents



- Content web page manually created
- Synchronization done using a command line tool via Real system

2000-2002

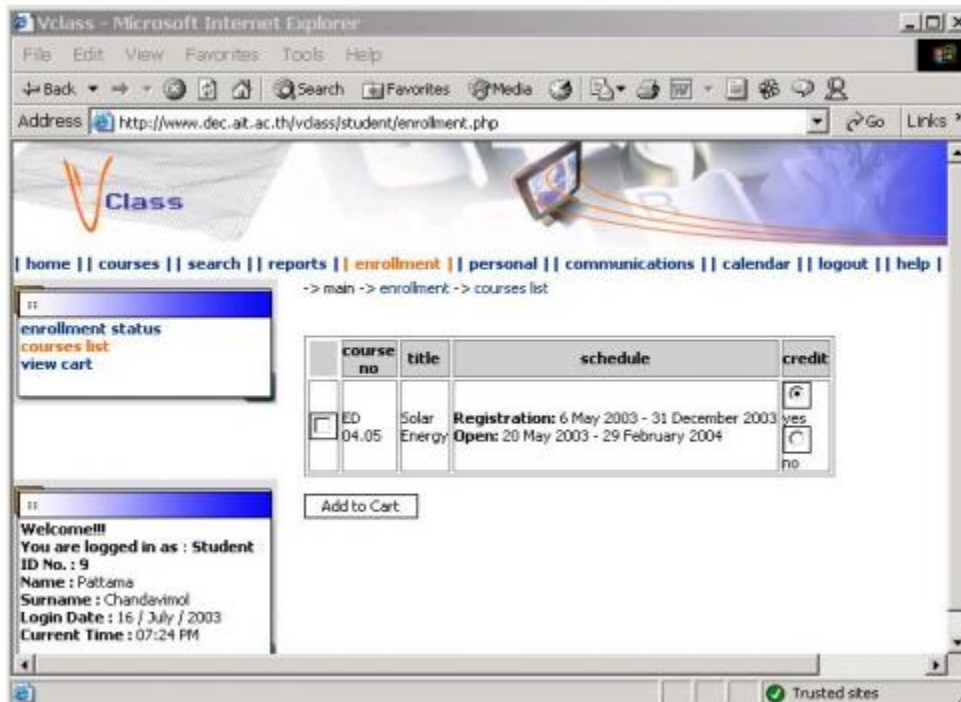
Web-base Class on Demand System (WCoD)



- Manage & deliver courses created using Authoring Tool
- Manage course enrollment requests
- Maintain user accounts

2003

VClass Learning Management System (VClass LMS)



- Support SCORM contents
- Communication Tools
 - ✓ Announcement
 - ✓ Calendar
- Score and Grading Tools
- Platform independent

2003 - Present

VClass Learning Management System

Supports Administrator ,Registry, Instructor, Facilitator and Student users

Student Tracking

Supports Multiple Nodes

SCORM 1.2 Conformant

Support Package Import/Export

Supports all Features on SCORM 1.2 Run Time Environment

Passed SCORM LMS Test suite Version 1.2.7 (Self Test)

Assignment Submission System

File Manager

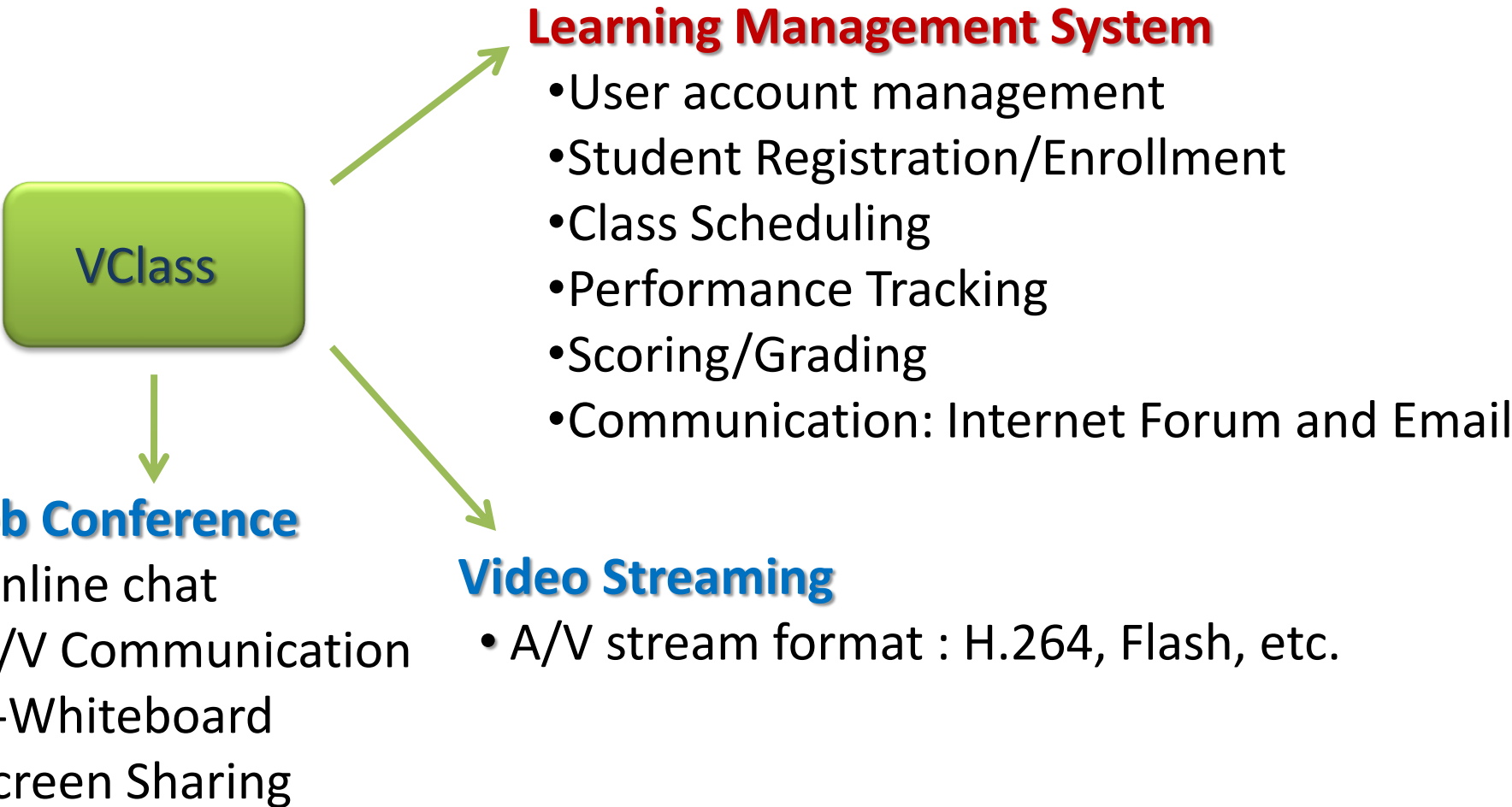
Single or Multi Upload(Using Java Applet)

Supports Unzip

Chat, Board, Calendar, Email

Virtual Class (VClass) components

VClass



```
graph TD; VClass[VClass] --> LMS[Learning Management System]; VClass --> WC[Web Conference]; VClass --> VS[Video Streaming];
```

Learning Management System

- User account management
- Student Registration/Enrollment
- Class Scheduling
- Performance Tracking
- Scoring/Grading
- Communication: Internet Forum and Email

Web Conference

- Online chat
- A/V Communication
- e-Whiteboard
- Screen Sharing

Video Streaming

- A/V stream format : H.264, Flash, etc.

Sample VClass LMS screenshot

Screenshot of the VClass LMS interface in Mozilla Firefox.

Browser Address Bar: http://vclass.dec.ait.ac.th/vclass/ait/student/course_content.php

Navigation Menu: Home, Courses, Reports, Enrollment, Personal, Help, Bug Report, Logout. User: VEP_1 First

Left Sidebar (Learn):

- Course Content
- Resource Search
- Tracking
- Logs
- Course Info
 - Details
 - Score Structure
 - Grade Structure
 - Instructor's Sched
- Communication
 - Email
 - Calendar
 - Course Board
 - Video Conference
- Tools & Settings
 - File Manager
 - Course Location
- Close

Course Content Table:

Session Title
1. Introduction (January 12, 2011) [Info]
2. Projective geometry [Info]
2.1. Introduction (January 18, 2011) [Info]
2.2. 2D Projective geometry: Part 1 (January 21, 2011) [Info]
2.3. 2D Projective geometry: Part 2 (January 21, 2011) [Info]
2.4. 2D Projective geometry (Cont.) (January 25, 2011) [Info]
2.5. 3D Projective geometry(January 26, 2011) [Info]
2.6. 3D Projective geometry (Cont.) (January 28, 2011) [Info]
2.7. Rigid (Euclidean) Transformation (February 1, 2011) [Info]
3. Statistical estimation [Info]
3.1. Introduction (February 1, 2011) [Info]
3.2. Direct Linear Transform (February 4, 2011): Live Chat! on Mon Feb 7, 2011 14:00(GMT+7) [Info]
4. Student project plan presentations [Info]

Status Bar: Done | 1.344 s | 1.436 s | 25.35 KB | 2 req | Tor Disabled

Menu Functions under Instructor Environment

Home

- ▶ Profile
- ▶ Inbox

Courses

- ▶ Course Content
- ▶ Tracking
- ▶ Logs
- ▶ Details
- ▶ Score Category
- ▶ Grade Structure
- ▶ Access Logs
- ▶ Work Summary
- ▶ Grades
- ▶ Email
- ▶ Calendar
- ▶ Course Board
- ▶ Video Conference
- ▶ Announcements
- ▶ Personal Folder
- ▶ Course Folder
- ▶ Import

Reports

- ▶ Grade Book

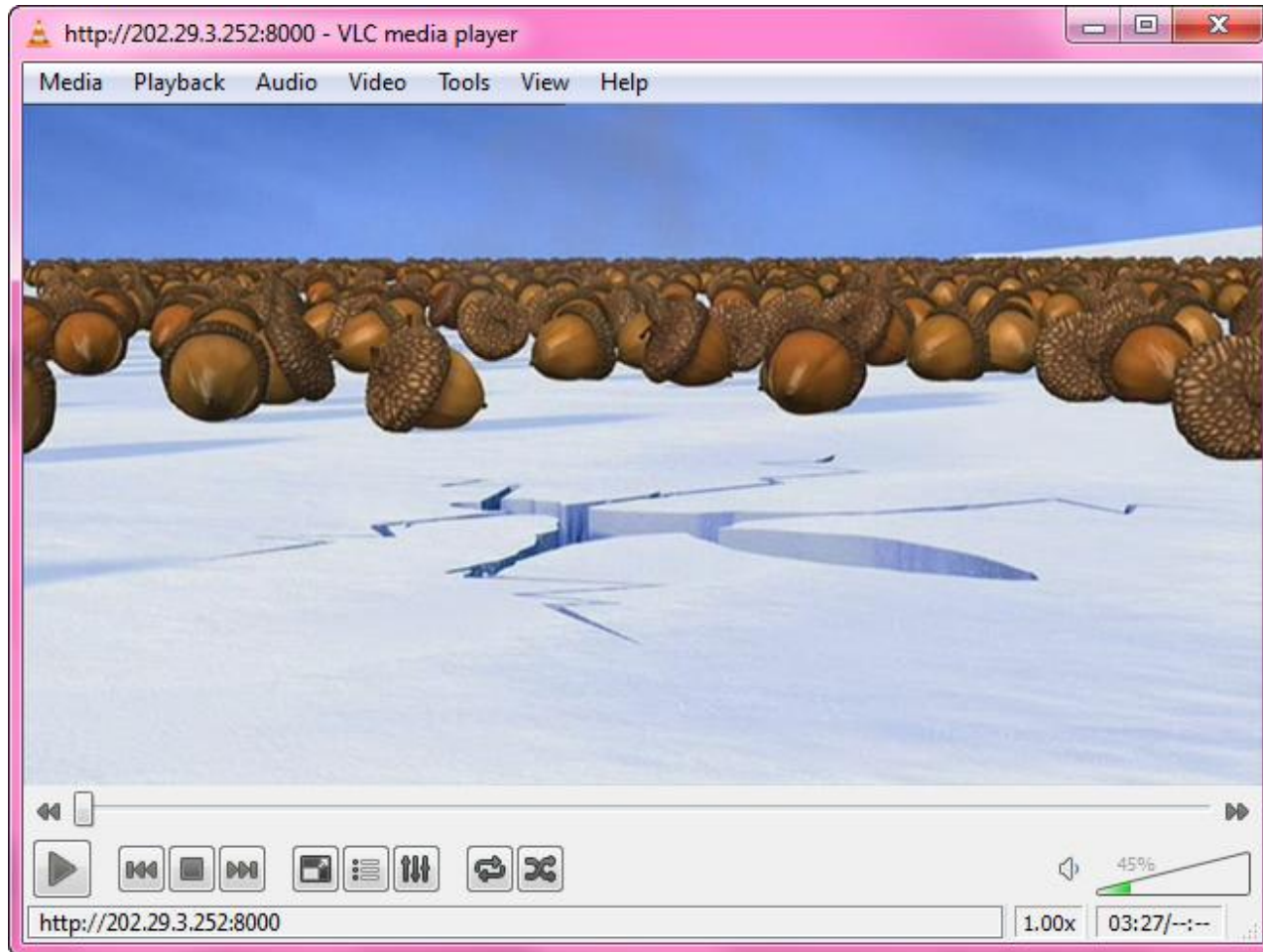
Enrollment

- ▶ Open Courses
- ▶ Request Status

Logout

VClass high bit-rate Video Streaming

Virtual Classroom learning and Virtual Class-on-Schedule



VClass HTTP Streaming

Virtual Classroom learning and Virtual Class-on-Schedule

Mozilla Firefox

http://vclass.dec.ait.ac.th/vclass/ait/student/session_nav.php?session_id=bf0d0936e2a5efae87c80d94213e4636



65:06

[Video Download](#)

Lecture Notes

[Introduction](#)

Submit File.. Notes [1] Introduction (January 12, 2011) <Previous Next> Exit

Transferring data from vclass.dec.ait.ac.th... 0.215 s 5.803 s 108.46 KB 1 req  Tor Disabled

Low bit-rate video streaming

Virtual Class-on-demand

The screenshot shows a Mozilla Firefox browser window with the address bar displaying `http://vclass.dec.ait.th/courses/ait/a52607899f82c6b12de47bef2243fdce/slide2.html`. The main content area shows a video player with a play button and a progress bar. The video title is "Introduction Estimation Problems". The video content shows a person standing in front of a screen displaying a slide with the following text:

Introduction
Estimation Problems

In vision, we are frequently confronted with **estimation** problems in which parameters of some function must be estimated from measurements.

Some examples of important estimation problems:

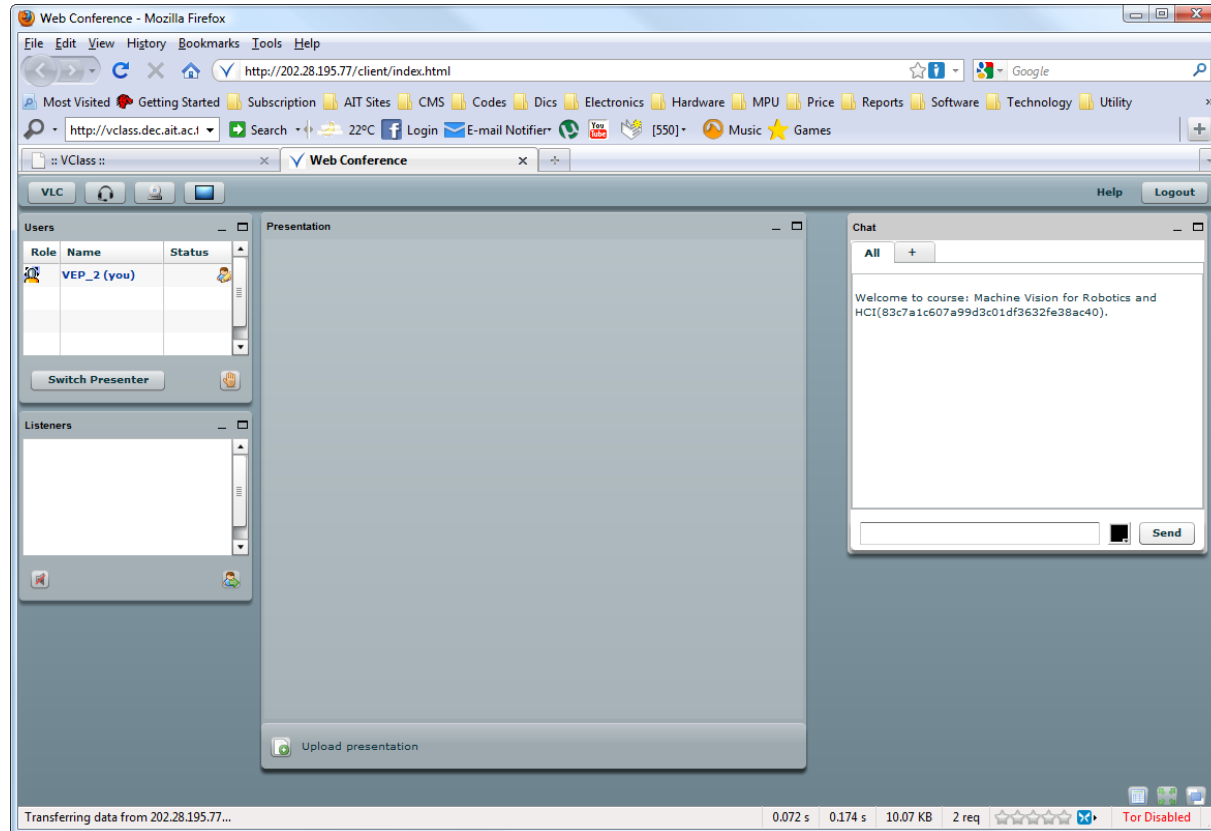
- **2D homography**: Given a set of points $\mathbf{x}_i$ in $\mathbb{P}^2$ and corresponding points $\mathbf{x}'_i$ in $\mathbb{P}^2$, find a homography taking each $\mathbf{x}_i$ to $\mathbf{x}'_i$.
- **3D to 2D camera projection**: Given a set of points $\mathbf{X}_i$ in 3D space and corresponding points $\mathbf{x}_i$ in an image, find the 3D to 2D projective mapping taking each $\mathbf{X}_i$ to $\mathbf{x}_i$.
- **Fundamental matrix computation**: Given a set of points $\mathbf{x}_i$ in one image and a set of corresponding points $\mathbf{x}'_i$ in another image, find the fundamental matrix F relating the two images.
- **Trifocal tensor computation**: Given a set of point correspondences $\mathbf{x}_i \leftrightarrow \mathbf{x}'_i \leftrightarrow \mathbf{x}''_i$ across three images, compute the trifocal tensor $\mathcal{T}_i^{jk}$ relating points or lines in three views.

The video player shows a progress bar at 05:02 / 16:16. The video title is "Matthew Dailey (CSIM-AIT) Machine Vision 4 / 2152". The video player interface includes a play button, a progress bar, and a list of video thumbnails at the bottom.

The taskbar at the bottom shows the following information: Transferri... 0.156 s 0.184 s 7.61 KB 3 req. The system tray shows the following icons: WJ Disabled, Tor Disabled, AS4767.

VClass Web Conference via BBB

- Showing lecture slides to learners
- Sharing lecturer's computer screen to learners
- Providing a communication mean for lecturer and learners

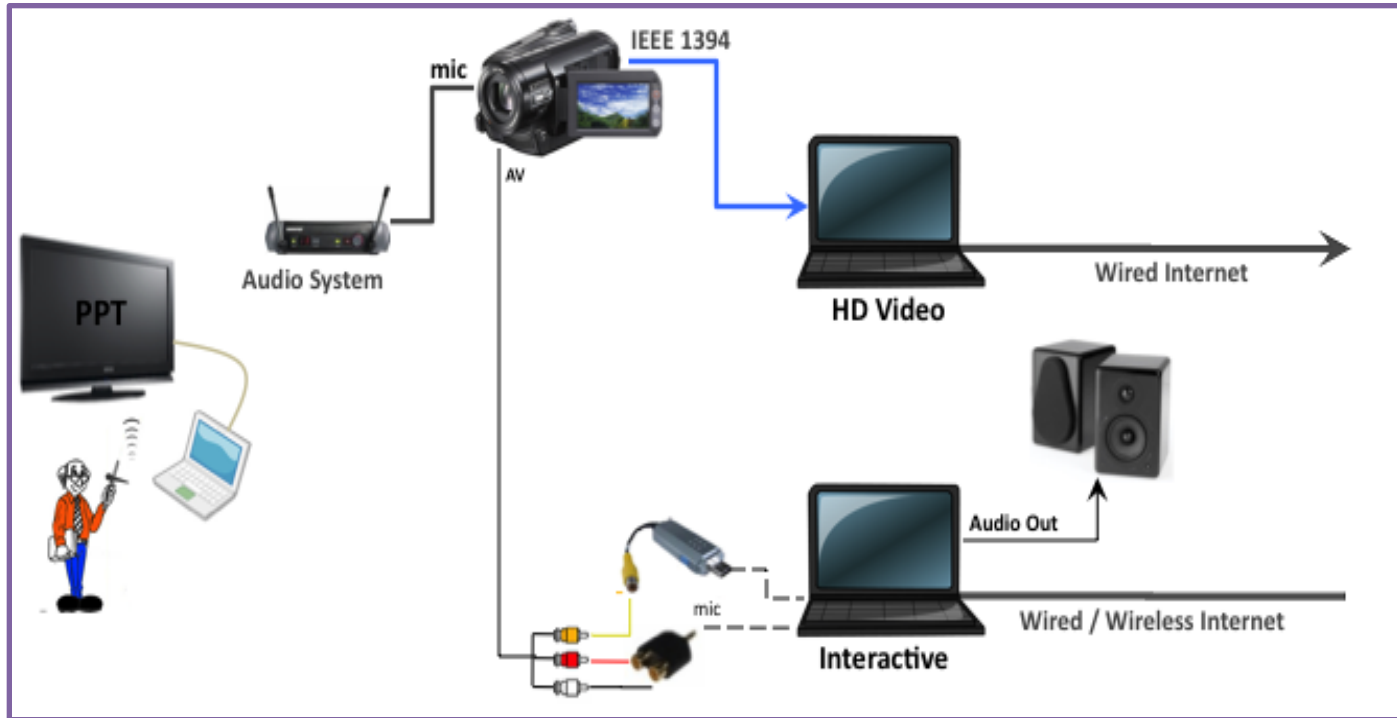


Learning Environments in VClass

- Virtual classroom learning : *Real-time lectures*
- Virtual Class-on-schedule : *Archived lectures*
- Virtual Class-on-demand : *Archived lectures*

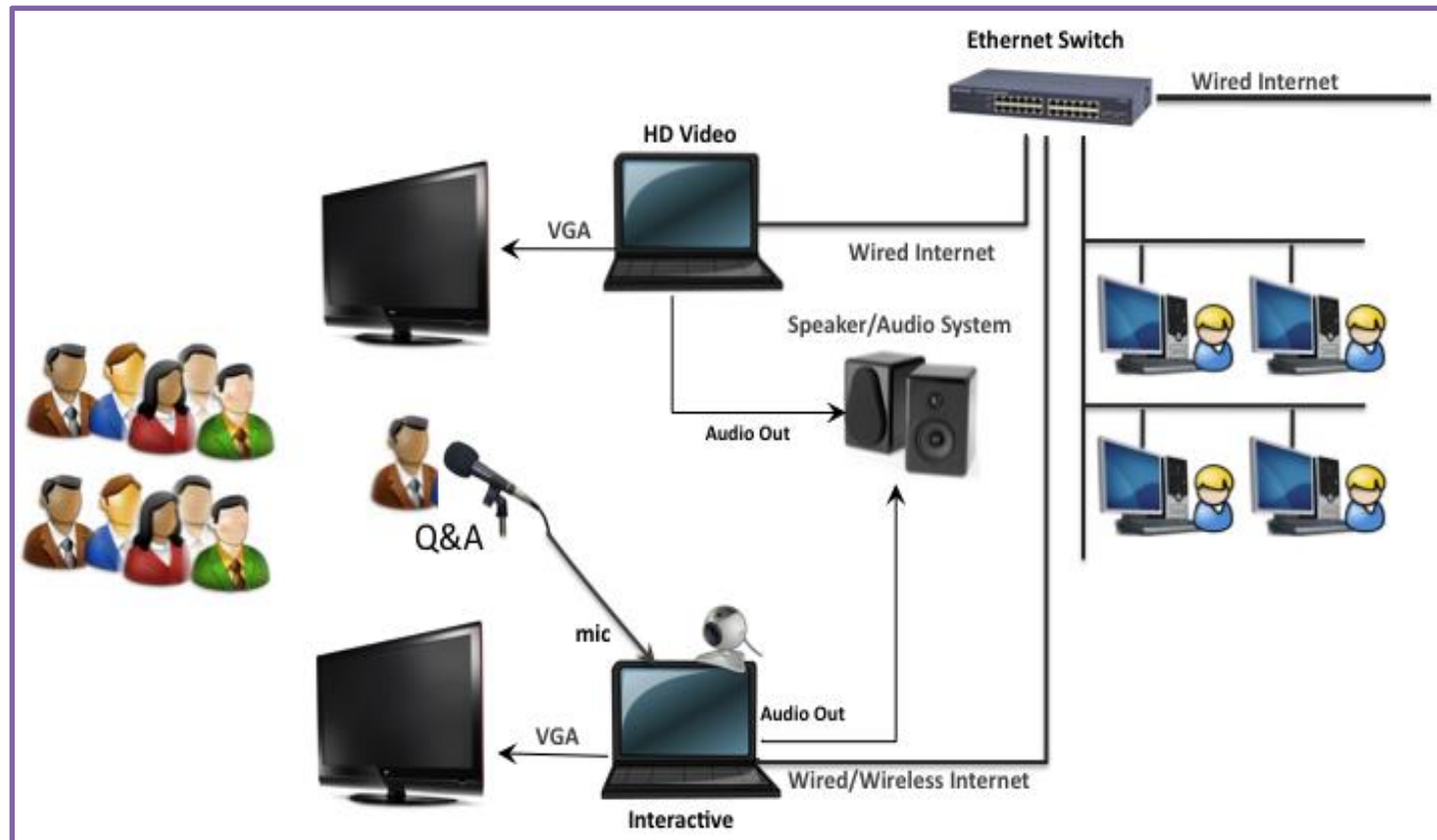
Virtual classroom learning : *Real-time lectures*

Equipment setup for sending online lecture



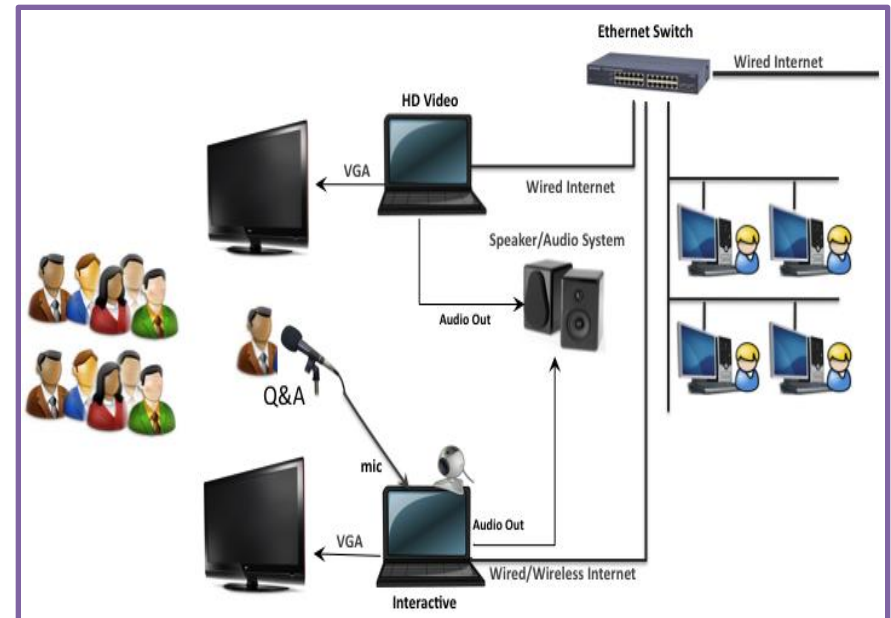
Virtual classroom learning : *Real-time lectures*

Equipment setup for receiving online lecture



Virtual Class-on-schedule : *Archived lectures*

- Class lectures are pre-scheduled.
- Contents are stored on VClass server.
- Lecturer is standing by to reply if there is any question or comment from learners during online session.



Virtual Class-on-demand : *Archived lectures*

- Learning is carried out individually on need basis.
- Contents are stored on VClass server.
- Learners' questions or comments are communicated to lecturer via asynchronous communication tools.



Examples Usage

Jan – Apr 2011 :

CanalAVIST – Virtual Education Project of Pakistan

providing distance courses for Virtual University Pakistan (Virtual Education Projects Pakistan)

Sender : Computer Science and Information Management program,
AIT

Receivers : Virtual Education Projects Pakistan

- NWFP University of Engineering & Technology
- Balochistan University of Information Technology,
Engineering and Management Sciences
- Institute of Management Sciences

Delivery technology:

BBB for both lecture streaming and interaction.

Courses :

- *Machine Vision For Robotic and HCI*
 - Scheduled broadcast of archived contents
 - Scheduled interactive session
- *Software Architecture Design*
 - Real-time broadcast with LIVE interactive session

Jun 2011 – present: UniChannel Project

A project to develop a digital media channel of Thailand's Inter University network (UniNET).

The project aims at providing channels for education, teaching, conferencing and lectures in order to provide rapid dissemination and sustainable sharing of knowledge, information and data among UniNET members.

UniChannel relies of 2 components:

**Network
Infrastructure**



**Hardware/
Software**

UniNET Network

- IPV4 / IPV6
- Unicast / Multicast

- VClass LMS
- Streaming (VLC)
- Interactive session (BigBlueButton)

UniChannel provides two modes of operations.

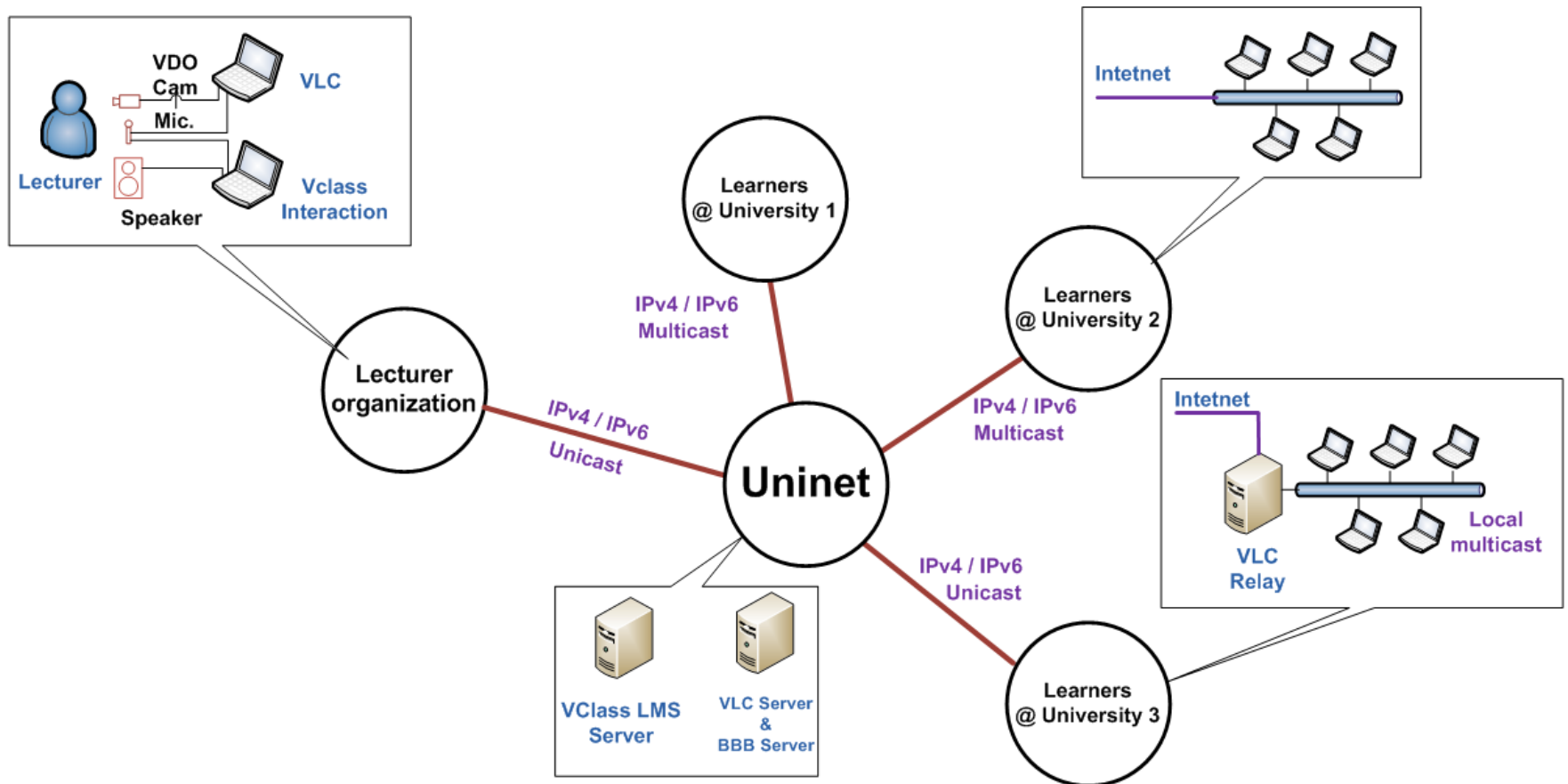
1. Contents Delivery

- Use VLC application to send , relay and receive lecture video streams among end-users, i.e., learners.
- Use BigBlueButton (BBB) application to delivery/share slide presentations and to provide means of communication/ interaction between a lecturer and learner(s).

2. Contents Management

- Archiving streamed contents and repackaging them for asynchronous viewing in low bandwidth end-users.

UniChannel System Overview



UniChannel's experimental online courses on UniNET

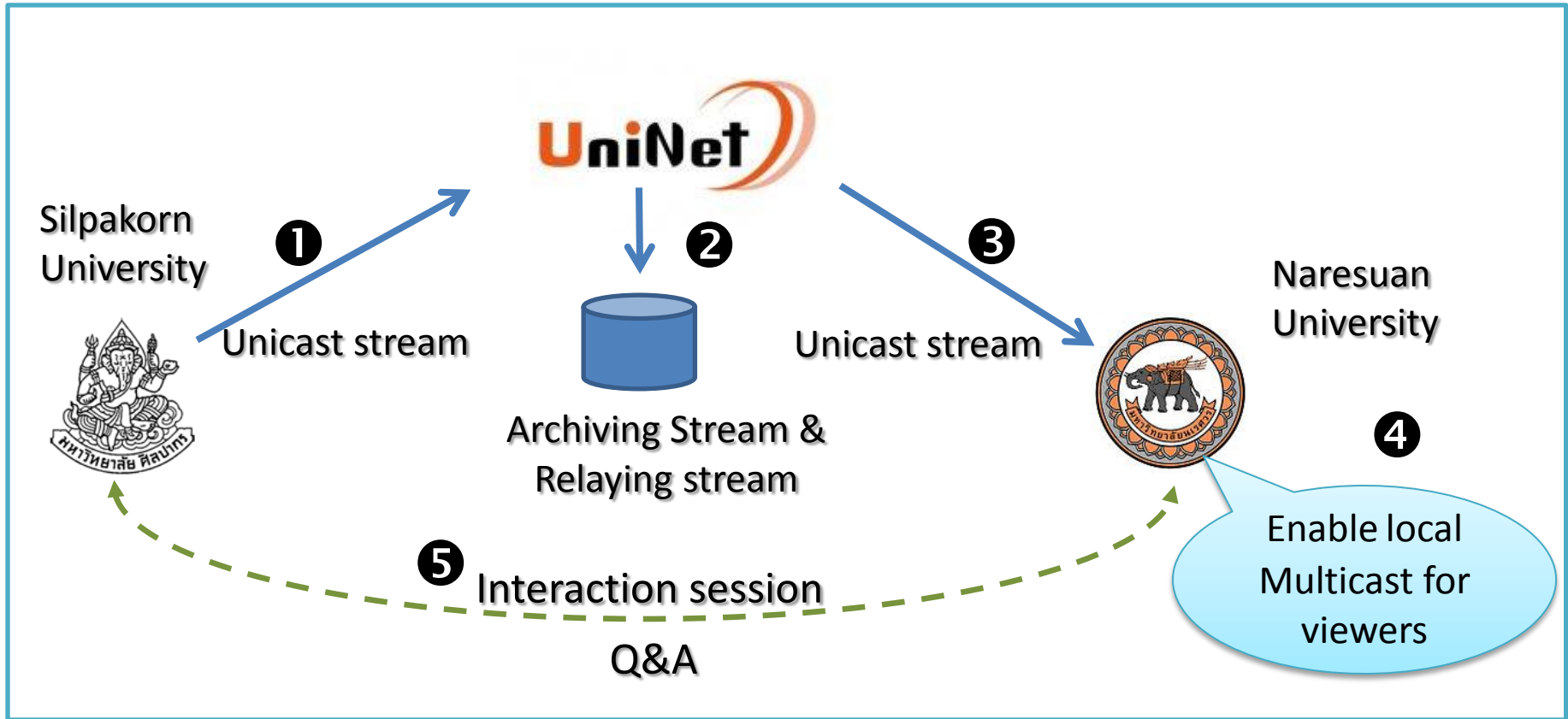
1. Virtual Classroom Learning

- **Course name:** Data Mining
- **Lecture sender:** Silpakorn University
 - ✓ Class size = 45 students
- **Lecture receiver:** Naresuan University
 - ✓ Class size = 30 students

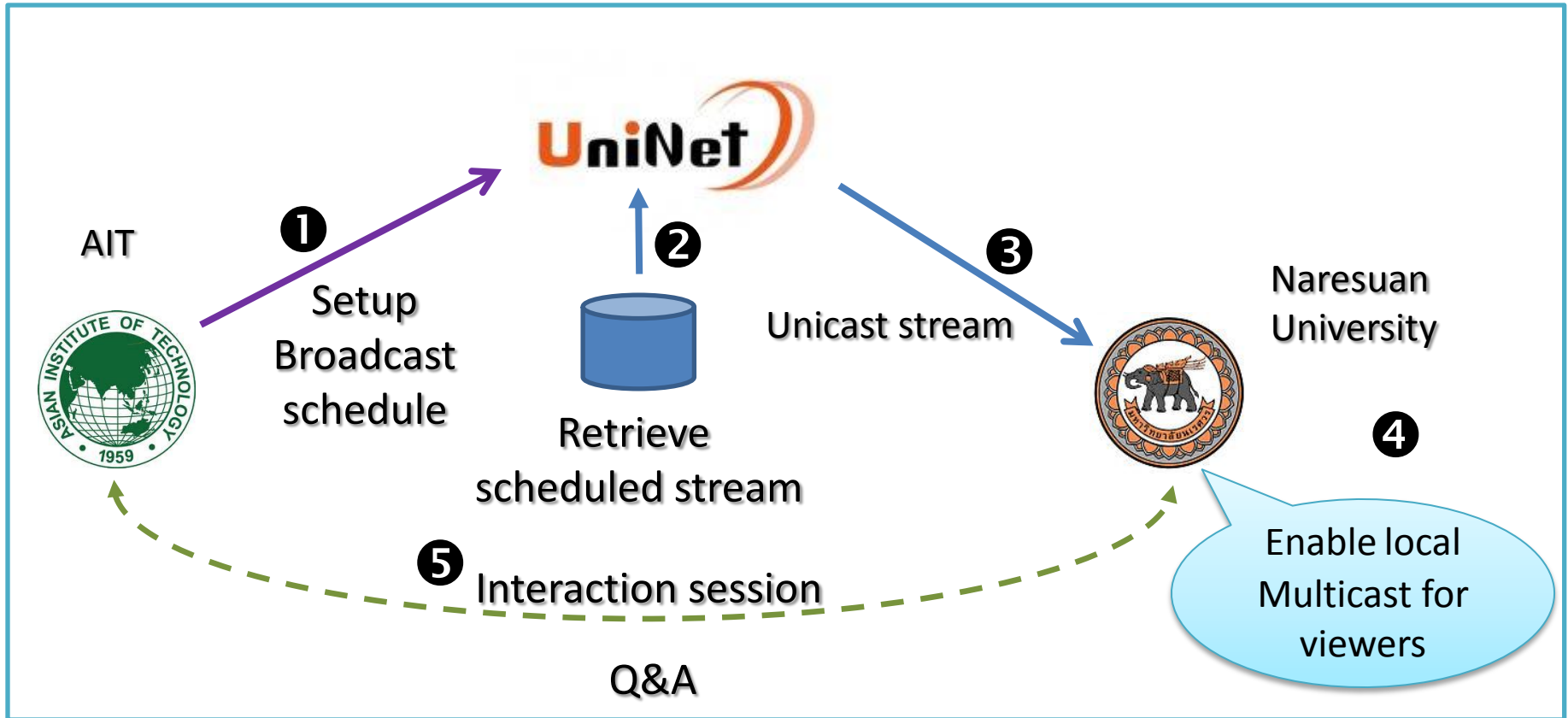
2. Virtual-Class-on-Schedule

- **Course name:** Machine Vision for Robotic and HCI
- **Lecture sender:** Asian Institute of Technology
 - ✓ Class size = none
- **Lecture receiver:** Naresuan University
 - ✓ Class size = 30 students

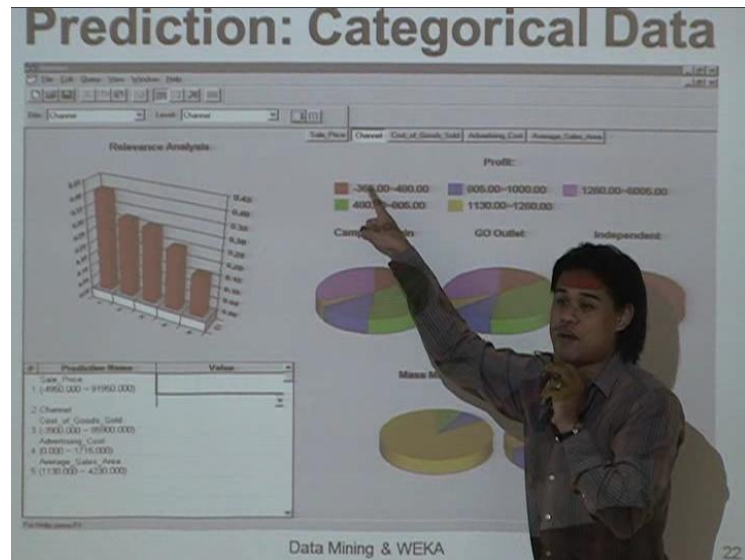
Virtual Classroom Learning Operational Flow

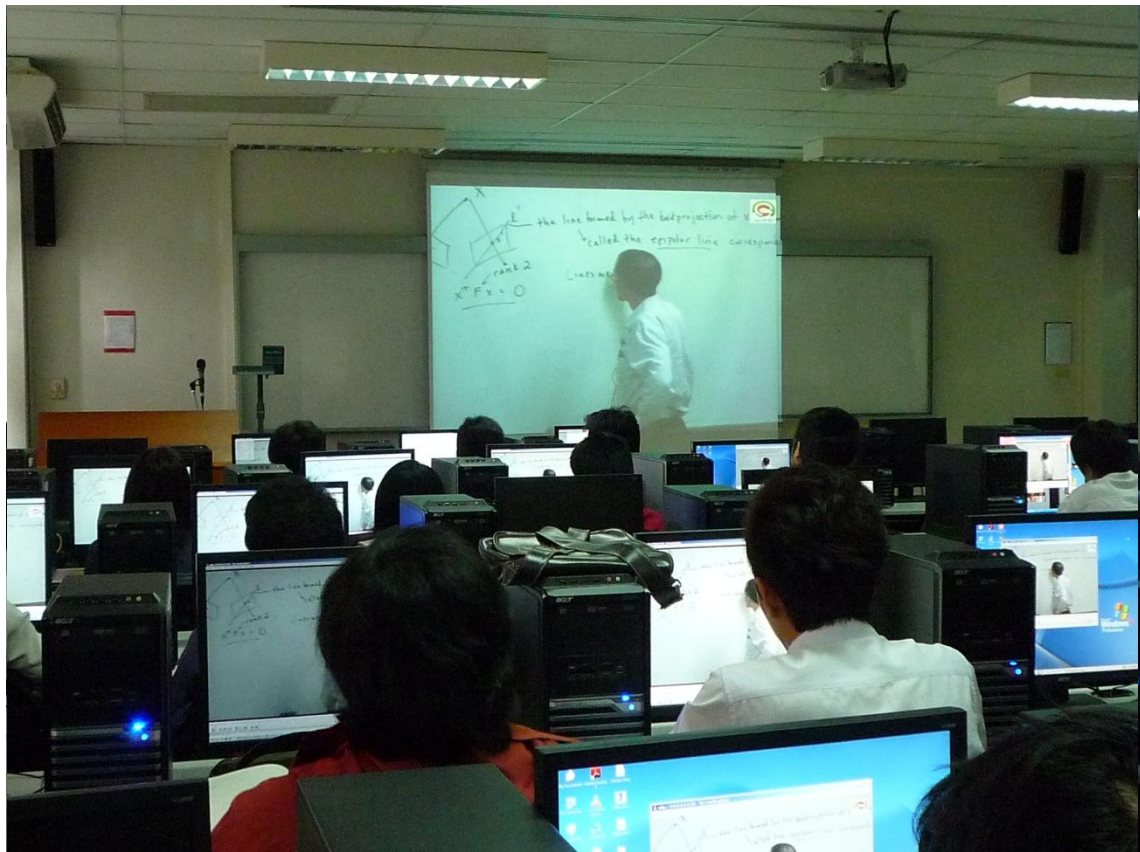


Virtual-Class-on-Schedule Operational Flow



Images from sending site





Thank you ...