LISTEN TO ME!

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Talk Outline

- Introduction
- Background
- Our Use of Podcasting
- Experience with Podcasts
- ReCap
  - Lecture Capture
  - ReCap Technologies
  - Tool Features
- Conclusions

Introduction

- Web-based instruction and course content delivery has become widespread
- Emerging web technologies (so called Web 2.0) enabling exciting new possibilities:
  - Blogs
  - Wikis
  - Social Bookmarking
  - Podcasts
- Dynamic content enables the instructors and students to communicate, cooperate and co-investigate in their teaching and learning process

Introduction

- Our own experience with using these technologies:
  - Blogs
  - Social bookmarking (del.icio.us)
  - Podcasting of lecture audio recordings
  - Web feeds for lecture notes
- Single faculty member's experience with minimal infrastructure support

Introduction

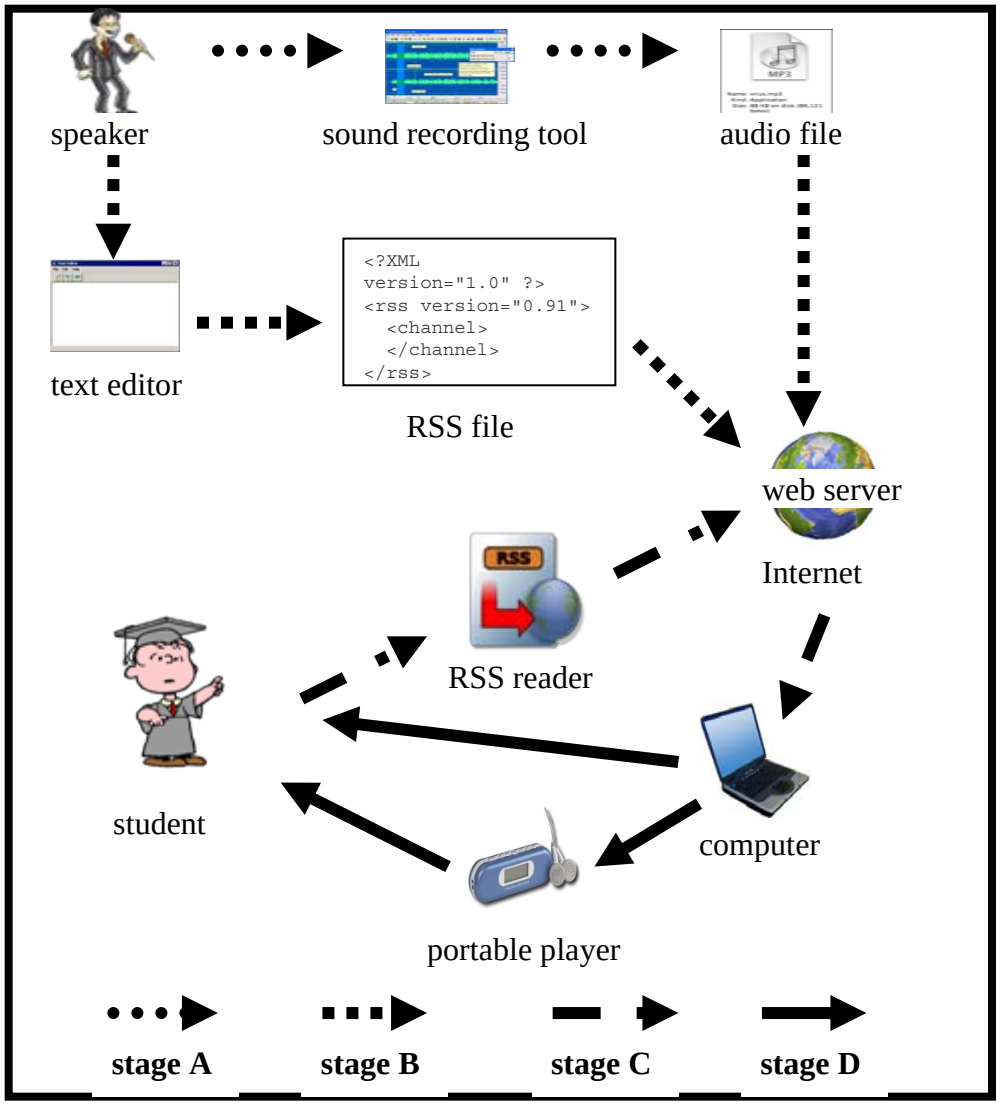
- Podcasting of lecture audio considered a welcome addition to lecture materials by students
- Capturing a classroom presentation while preserving as many key elements of the lecture has always been the holy grail of any lecture capturing environment
- Can we automate the lecture capture process?
- Can we allow for digital ink annotation and whiteboard and capture all the annotations/writings automatically?

Background

- Social software, like blogs, wikis, podcasting etc. have emerged as the new components of what has now been labeled as Web 2.0™ [Alexander 2005]
- Emerging technologies in the classroom [D'Souza , Richardson]
- Podcasting in education [Chan and Lee, Hartigan, Brittain]
- Many approaches adopted institution wide [Hartigan, Brittain etc.]
- Apple iTunes University

Podcasting

- Process of making an audio podcast
  - Content Capture /production
  - Encoding
  - Publishing online
  - Subscribing /downloading and listening



Our Use of Podcasting

- Podcasting
  - Mainly in-class lecture audio recorded and made available online
  - A simple MP3 player (a Samsung Yepp YP-T6 MP3 player) to record the audio during the lecture
  - Audio can be downloaded through subscribing to a podcast of the audio or directly on the course web page
- Managed by putting a XML file containing the podcast information online on the course website
- Minimal post-processing (just 15 minutes to convert and upload audio and setup podcast)

Experience with Podcasting

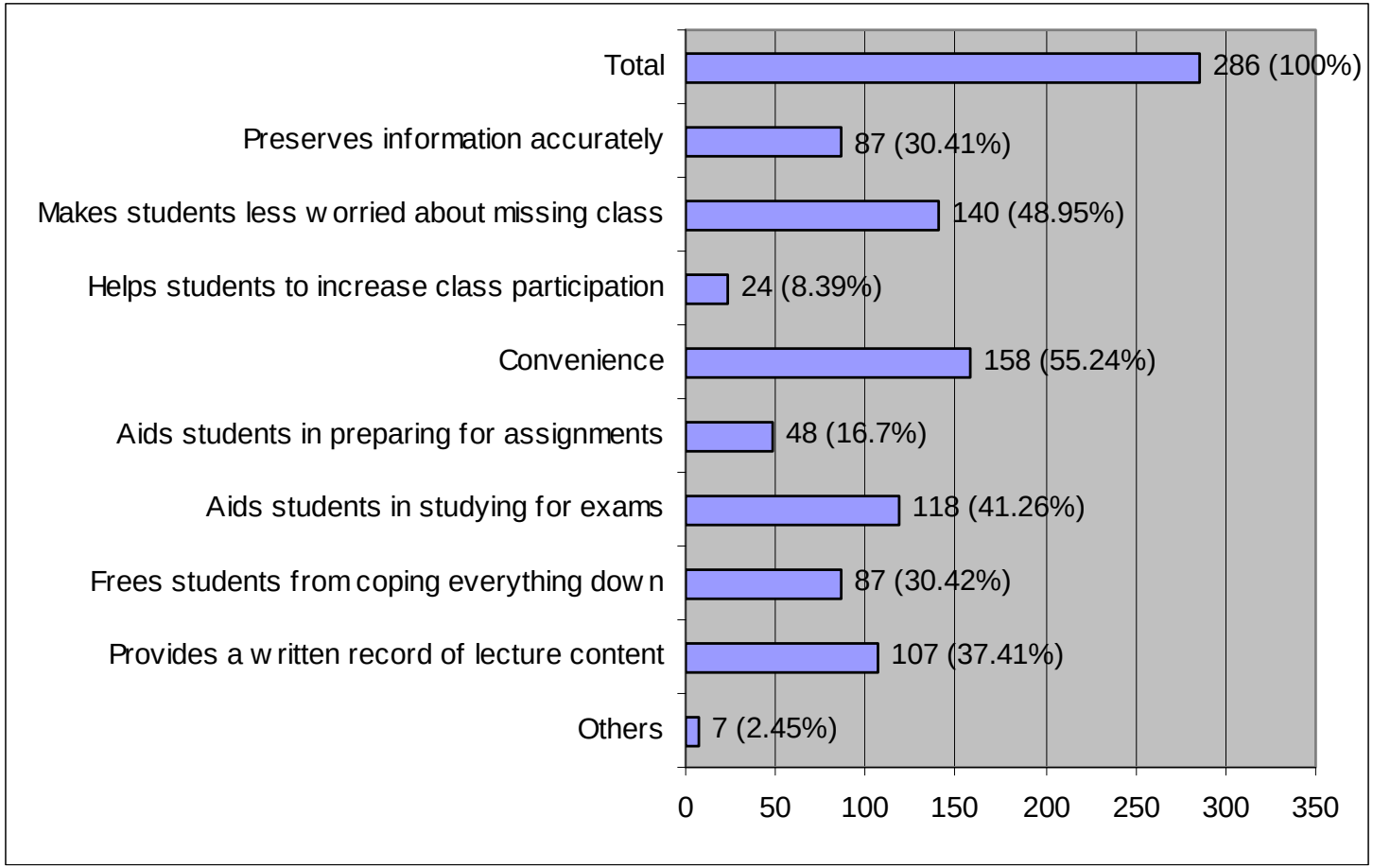
- Successfully tried out in four different courses over the past two years (approx. 300students)
- Students very receptive to the new technology
- Student opinions gathered through regular surveys

Experience with Podcasts

- Close to 70% of the students downloaded and listened to the lecture audio
  - Most of the time they listened to each recording once.
- Most students downloaded and listened to only about 5-20 minutes of the audio.
  - Listened to only the portion of the audio that was specifically of interest to them, rather than the whole lecture
  - Mainly to review the hard-to-follow parts of the lecture and review the material.
- Surprisingly most students listened to the lecture audio on their personal computers (80%) rather than portable audio devices
  - Contrast to observations in other places where portable devices seem to be the favored listening option
  - Portable media players, especially MP3 players prevalent among the students
  - Viewed as entertainment devices and not as educational devices.

Podcasting Advantages

- **Which of the following statements do you think are the advantages of lecture Podcasting (i.e. the recorded mp3 audio lectures)?**

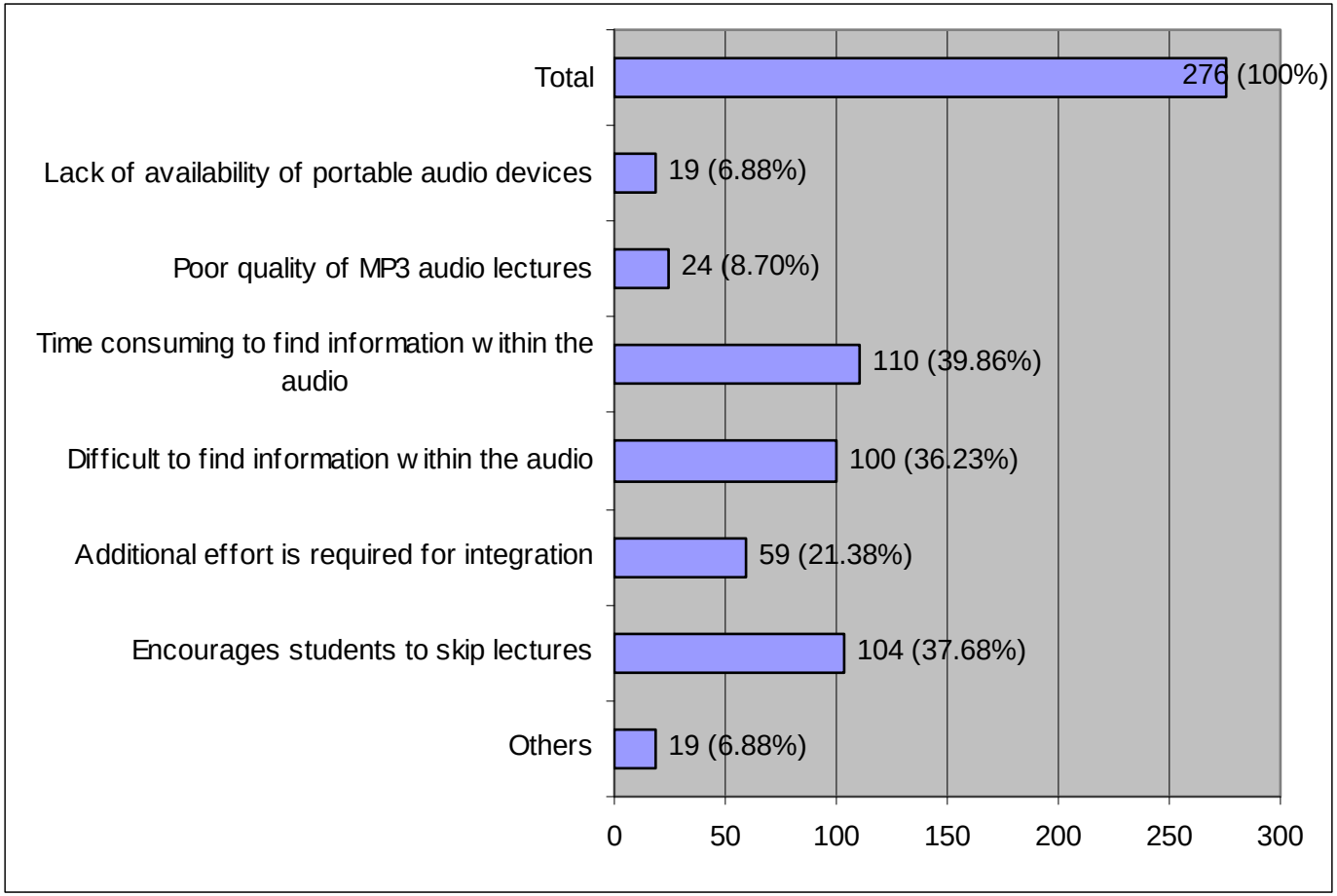


Experience with Podcasts

- Many students found that listening to the complete lecture audio was not useful. Instead they wished to review only a part of the audio
  - On a portable audio device, fast forwarding and rewinding functions are not supported, and hence they are not conducive to this mode of listening
  - PC enables us to select and listen to only a portion of the audio. This seems to support the reason for students favoring the PC as the listening device.
- Students found it difficult to find the specific location within the audio file which corresponds to a particular slide used in the lecture presentation
  - Preferred some kind of indexing or synchronization of the audio file with the PowerPoint presentation
    - Cannot be provided on a portable media player. But, this is possible on a PC
  - The students' expectations are higher because of the capabilities of the device on which they listen to the lecture, in this case a PC

Podcasting Shortcomings

- **Which of the following statements do you think are the disadvantage of lecture Podcasting (i.e. the recorded mp3 audio lectures)?**

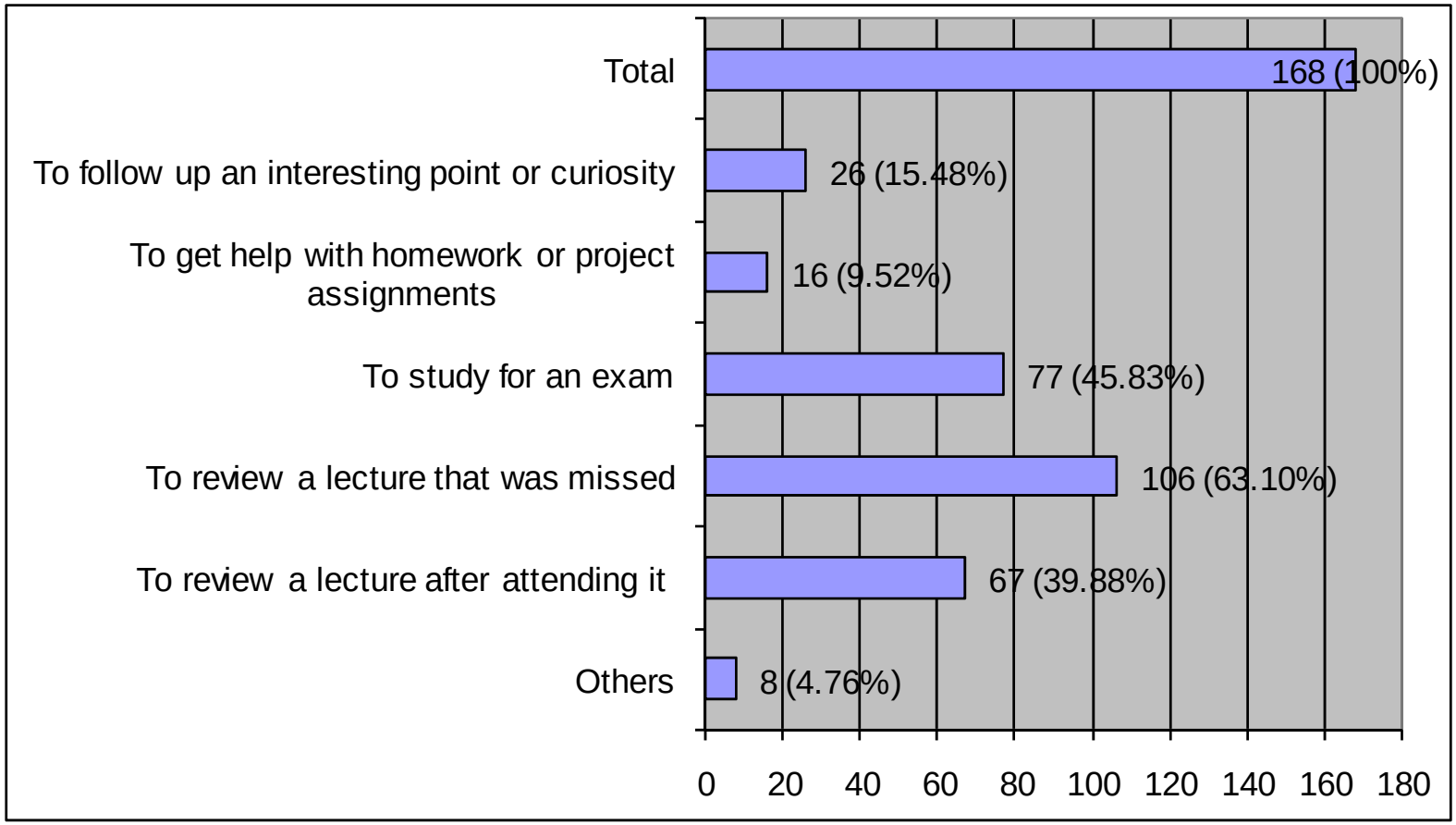


Experience with Podcasts

- Many students prefer to listen to the lecture as a way of reviewing the materials covered in the class
  - This provided them additional reinforcement for their understanding of concepts as they could always revisit our lectures and review the materials that they found difficult to understand the first time around
  - The students found this to be very useful especially when they were reviewing the materials for examinations
  - Further evidence corroborating this fact is that most students mentioned that more often they listened to the audio just before examinations
- Availability of the recorded audio gives them the confidence that they can always review a difficult concept again just in case they do not understand it in the first time
  - This also takes pressure off of them from having to take detailed notes during the lecture which might detract their attention from the lecture

Podcasting Uses

- **Major reason(s) for accessing the mp3 audio lectures**



Experience with Podcasts

- Opinions have been expressed by many educators that the availability of lecture audio or video may encourage students to skip classes
- In our own experience, this effect was not that perceptible. There was an insignificant drop in class attendance
- Students themselves seem to express the opinion that the availability of lecture audio does not seem to have any major impact on their decision to attend or skip lectures
- While the availability of the lecture audio does take the pressure off of them especially if they occasionally miss a lecture, but it does not seem to promote absenteeism
- The students seem to value the in-class interaction and classroom dynamics a lot more and see it as a valuable component of their learning experience.

Experience with Podcasts

- One of the major points being mentioned in favour of podcasting and making available lecture audio is the fact that students who are non-native English speakers would definitely find it beneficial.
  - Hong Kong offers an excellent experimenting ground for this theory. Tertiary (university) education in Hong Kong is taught exclusively in English
  - However most of the students entering the university here have received their schooling mostly in their mother tongue, which in this case happens to be Cantonese
  - They do find some difficulty in adjusting to being taught in English. Very often the students' command over English is not very good
  - Added to this, they are now faced with being taught in English by faculty members who hail from all over the world, some of whom are not necessarily native English speakers
  - With recorded audio, they get to listen to the lectures again to fill in the parts they found difficult to follow in the first place.

Experience with Podcasts

- Students found it difficult to find the specific location within the audio file which corresponds to a particular slide used in the lecture presentation
  - Preferred some kind of indexing or synchronization of the audio file with the PowerPoint presentation
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How to Address This Need?

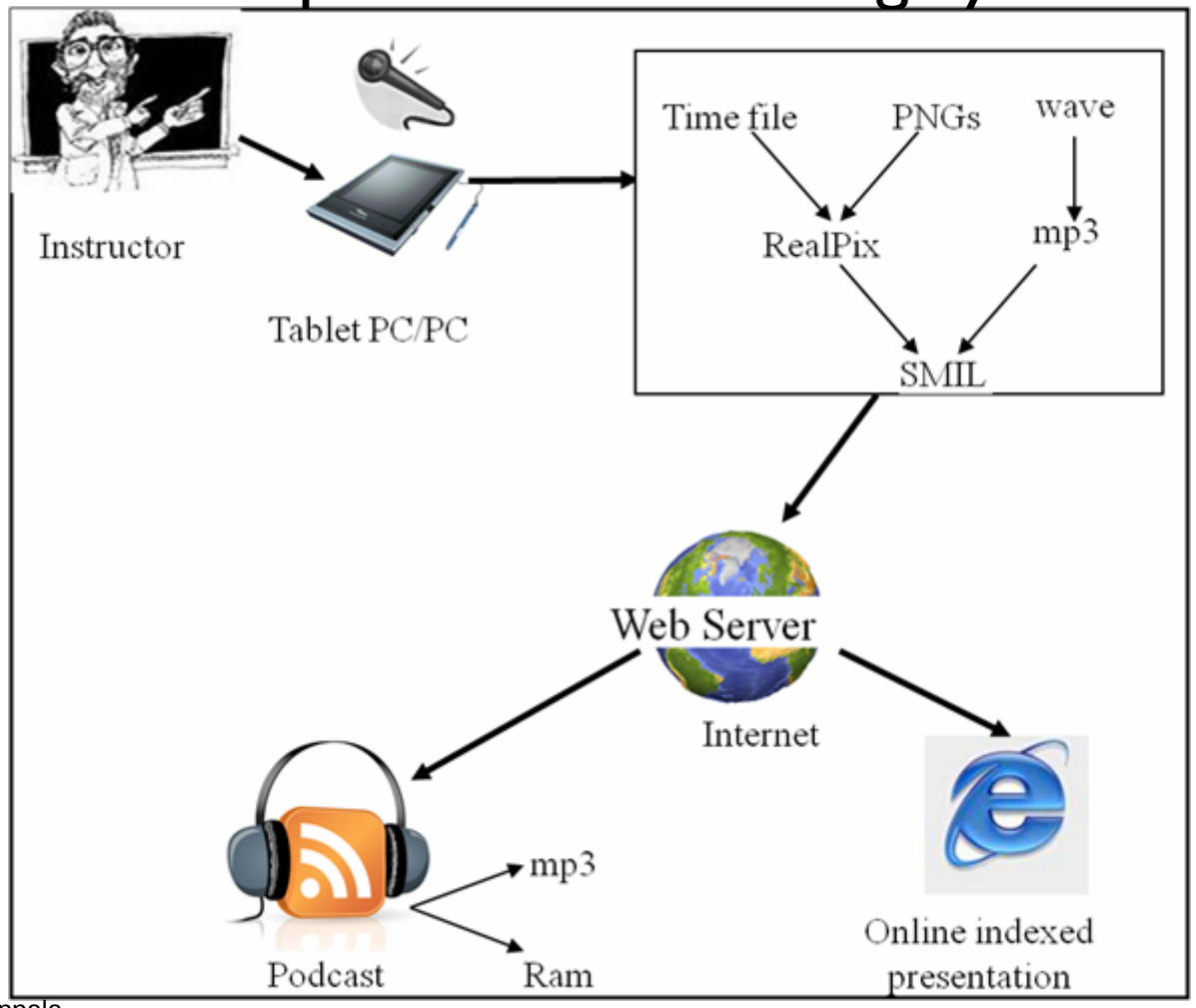
- Lecture capture technologies have been developed in the past:
  - Classroom 2000, Classroom Presenter, Ubiquitous Presenter, Lectern, WriteOn
- Full-fledged video incurs significant storage and bandwidth costs
- We developed a new automated lecture capture system, ReCap, that captures and automatically synchronizes:
  - Powerpoint presentation
  - Digital ink annotations/writings
  - Audio

ReCap Features

- Non-intrusive integration with PowerPoint
- Requires minimal effort to learn and use
- No need to convert presentations from PowerPoint to any other specific format
- Minimal post-production cost
- Indexed presentation so that students can easily locate the specific content that they are interested in a lecture
- All key dynamics of a lecture are transparently captured
- The storage requirements for the presentation are small compared to full-fledged video.

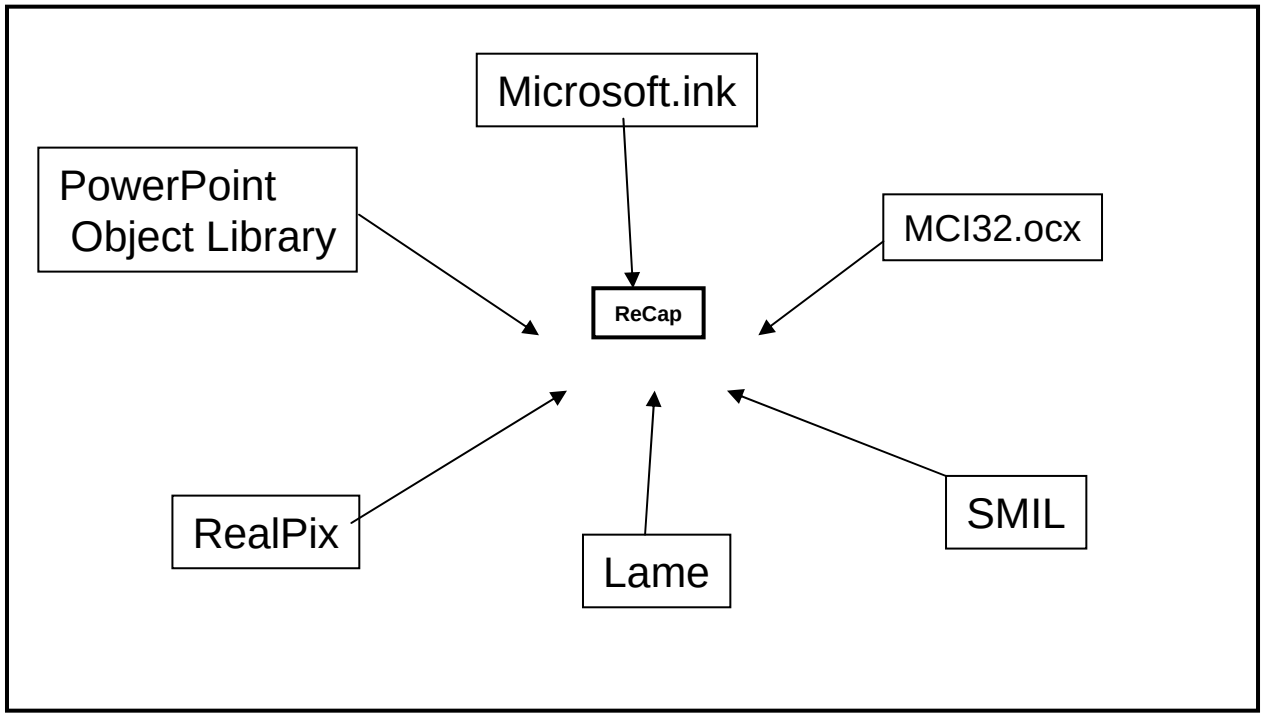
ReCap System

- Lecture Capture and Publishing System

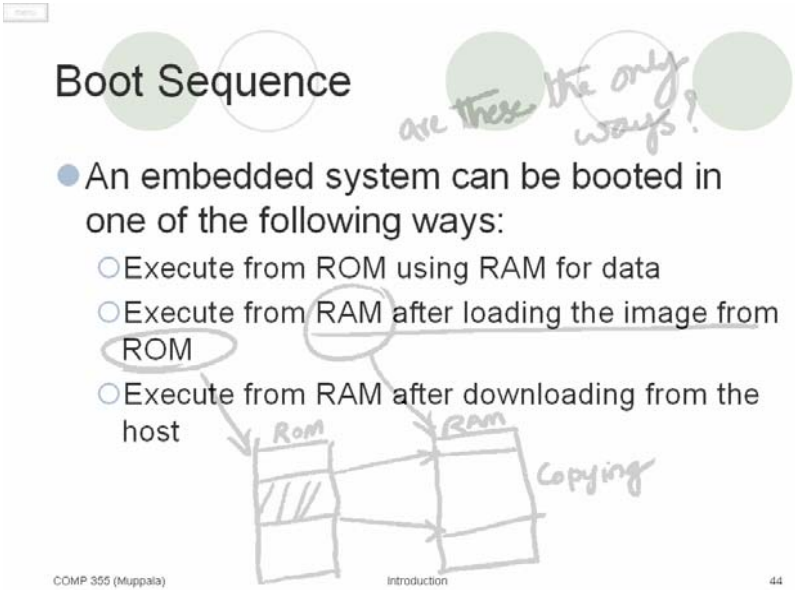


ReCap System

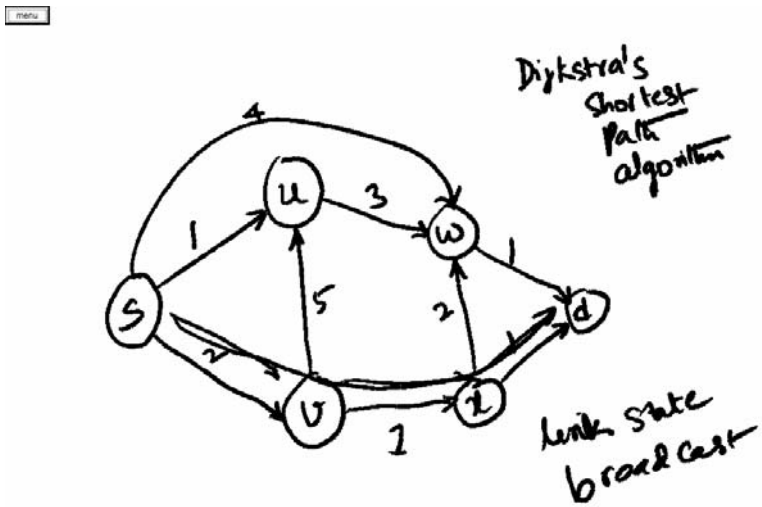
- Technologies Used:
  - implemented in Visual Basic using the .NET 1.1 framework



Digital Ink Annotation



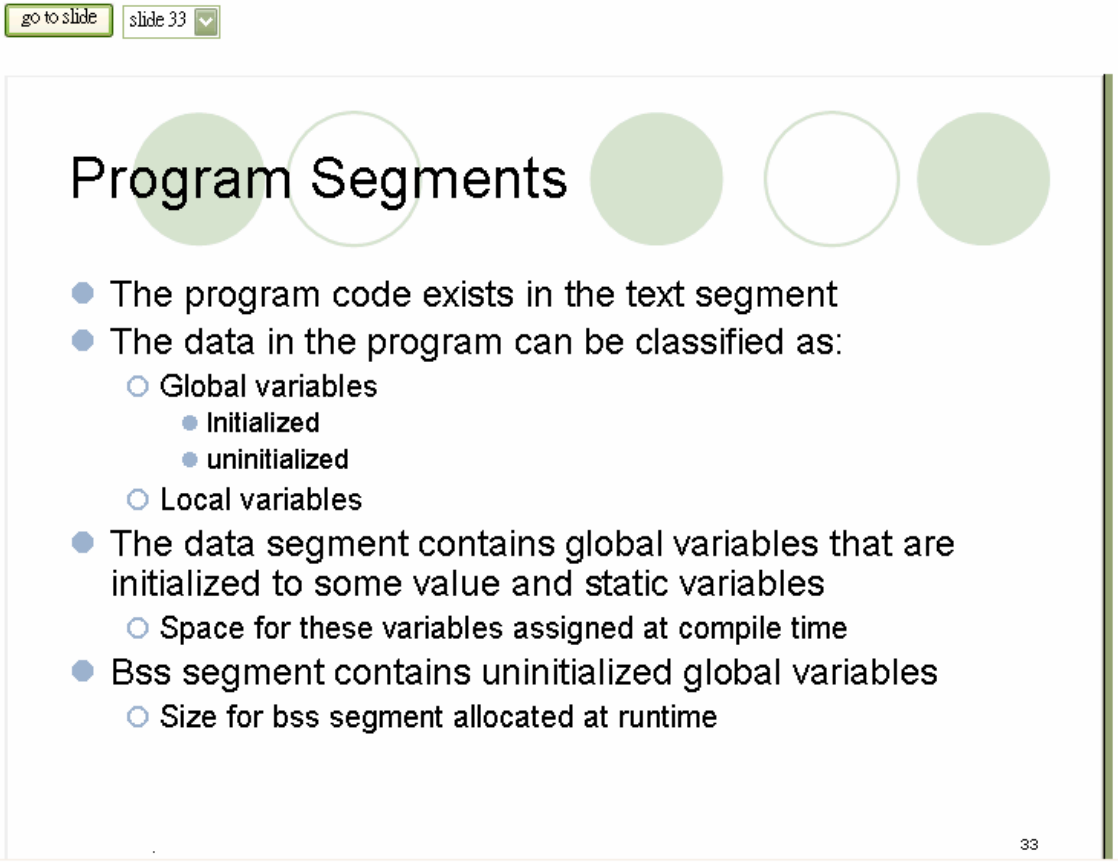
(a) Transparent Overlay



(b) Whiteboard

Online Indexed Presentation

- Slide level and Ink Annotation level indexing
  - Using PHP
  - Works on IE only
  - Needs ActiveX



Tool Comparison

	Pre-recording conversion	Triggering conditions	Elements captured	Level of replay	Output format	($) or (F)
ReCap	No	automatic	Annotation over slides, audio	stroke	SMIL, RealPix, mp3, PNG	F
Camtasia Studio 4.0	No	manual	all desktop activities, audio, webcam images	stroke	swf, wmv, mov, avi, mp3, rm, camv, gif	$
PowerPoint 2003	N/A	manual	annotation over slides, audio	slide	ppt	$
CamStudio	No	manual	all desktop activities, audio	stroke	avi, swf	F
LectureScribe	Yes	manual	annotation over slides, audio	stroke	lec (its own format)	F
Classroom 2000 / ZenPad / eClass	Yes	manual	all desktop activities, audio	stroke	Online[2]	F
Classroom Presenter	Yes	manual	annotation over slides	stroke	csd (properietary format)	F
Ubiquitous Presenter	Yes	manual	annotation over slides	stroke	csd (same as above)	F
Lectern II	Yes	manual	annotation over slides, audio	stroke	SMIL	$
WriteOn	No	Manual	all desktop activities, audio	stroke	avi, wmv	F

Conclusions

- Podcasting is effective means of enhancing course materials
  - Welcomed by students
- Our experience is only one point of reference
- Automated lecture capture system that captures and automatically synchronizes:
  - Powerpoint presentation
  - Digital ink annotations/writings
  - Audio

Conclusions

- Minimal overhead and ease of use
- Small storage and bandwidth requirements
- Detailed analysis, results and discussion available on our project website
- For more details:
  - http://www.cse.ust.hk/podcast/