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Automated transcription of spoken-word lecture materials

...supporting hyperlinked communies of co-learners

University of the West of England, BRISTOL

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CISC Information Systems Community Centre

1

Staff FTP upload

2

Mp3 audio pool

Gap/Silence detection

3a

Multiple audio segments

Automated transcription

Multiple text fragments

Timecoded transcript skeleton structure

3b

First draft transcript

Staff edit/review

4

Final aproved transcript

Keyword Indexing

5

Transcript database

Search, view annotate, link

6

End users staff & students

1. Staff record lectures with MP3 recorders in lecture theatres

2. Staff upload to a central server for processing

3a. Audio is segmented based on pauses in speech.

The timing of each pause is used to build a skeleton structure with timecoded "paragraph" slots

3b. Each audio segment is converted into text using transcription software.

The text for each segment is inserted into the skeleton "paragraph" slots to form a timecoded transcript draft.

4. Staff receive an email linking to a web-based interface (where audio for each segment is available) so that the transcript can be reviewed and aproved.

5. The aproved transcript and audio is uploaded to a content management system for keyword indexing.

6. Students and staff searching the database for keywords see the exact paragraph in which their search term appears as a hyperlink. (See lower right panel)

* Currently staff manually upload audio.
It is planned to install integrated MP3 recorders into the speaker amplification system. Such recorders will be networked so that lecture audio can be fetched by the processing server, thereby automating this part of the process.

* Currently, compiling a single timecoded transcript (in step 3b) requires human intervention to integrate text from individual segments into the skeleton structure.

* The system uses the opensource Content Management System "Sakai" and "ProjectPad" to provide the transcript database separately from the UWE Virtual Learning Environment (VLE), Blackboard. Integration with the university-wide VLE is planned at a later date.

Further improvements

* Implement dedicated profiles for each staff member. Currently a shared profile is used to reduce staff training time, but at the cost of lower initial accuracy.

* Iteratively reduce the time required for staff to aprove transcripts by feeding corrections to errors back into the automated transcription engine.

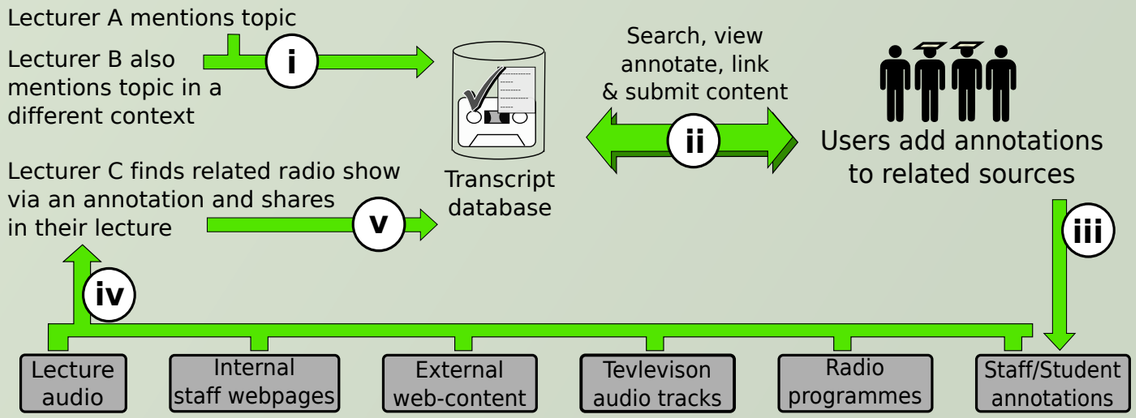
* Allow corrections made to one segment to affect all others in a particular transcript. In the current system, each segment is a separate entity. This can lead to repeated edits of identical errors across segments.

* Automate more steps and improve user interfaces. For example, uploading data to the Content Management System (CMS) currently involves lengthly human interaction.

* Expand transcription to other speech-based AV materials - such as radio programmes, Youtube videos, podcasts, etc.

Hyperlinked communities of co-learners

Users searching the CMS for keywords see search results as hyperlinks to the paragraph in which their search terms appear. Users are encouraged to collaboratively annotate materials, adding cross-references (both to other materials inside the CMS and to external content) to support learning by other users (students AND staff).



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