HP Educenter - Making Educational TV Programs and Videos available on demand

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Summary

There is a lot on educational TV, but it is not there when student needs it! TV transmission follows its own schedule which does not suit all the students interested in it. Further, the student is not always motivated adequately to spend time viewing a program and giving it the necessary attention. The solution described here is in the form of an institutional archive which captures all TV content of interest to its students and available to it under the copyright law. This content is stored in a digital library, allowing students and faculty to search and view anything of interest to them on demand, round the clock, round the year using any PC on the LAN.

TV Programs in Digital Libraries

Digital Libraries are being created worldwide in large numbers; this is particularly noticeable in emerging market countries which are racing to catch up with the rest of the world. The huge demand for education in these countries makes digital libraries particularly valuable.

This note describes HP Labs India's contributions in creating tools for use with digital libraries. These tools can be used with several types of digital library software; DSpace, a popular system in open source form is one such. HP Labs has contributed to the creation and development of this system.

The focus here is on acquiring and storing material such as TV programs and video clips. The tools described help address the problem of making video content available on demand. Our focus emphasizes institutional use of an organized digital library offering multimedia content to hundreds of students who access it through a number of PCs on a LAN. In addition to students, faculty members need the video content to serve as raw material for producing interactive multimedia programs.

Working systems have been made available to academic partners who will develop interactive multimedia content, and give us feedback on the educational value of these systems.

Problem

Educational institutions in emerging market countries serve a large population of students, and impart training in professional and non-professional courses. However, teaching methodology, and the kind of technical aids that are being used in the education sector have not tried to take full advantage of advancements in ICT. This is particularly true while considering usage of multimedia in education. Faculty members rarely make video clips out of TV programs for use in interactive presentations.

Multimedia content has to be a judicious mix of print, audio and video, that allows for diversity in instructional materials. Multimedia enables the teacher to provide the student with an experience of the concept, rather than just a lecture, since it can include video clips, simulations and animations. Moreover, multimedia can provide an enhanced or augmented learning experience at a low cost per unit.

Educational TV has seen considerable investments .We should mention that Gyandarshan, an educational channel that is available on the Direct - to - Home band has the widest reach at the moment. However, educational institutions still under-utilize educational TV. There will be an improvement when a few educational channels move from the C-Band to the widely available DTH band.

While there is a lot on TV, it is not there when you need it! Educational TV schedules are not easily available in advance, telecast timings do not often suit college timings, and students lack the motivation to listen to TV programs when this is not in their immediate interest. What is needed is the organized acquisition, storage of TV and multimedia material in a digital library, and making them available on demand to any one on a LAN as and when they need it. Personal video-recorders alleviate this problem somewhat. But even here, a student has to consciously archive programs which are not important for him at that time, but are likely to become important some time later, for instance, while he is preparing for an exam on a particular topic.

The technology has great value for distance education and for school education as well. Distance education students in India go frequently to any one of several hundred study centers, where such systems could be housed. Over a million students fall in this category. A much larger number of students undergo education in brick and mortar colleges and universities. They need such facilities equally badly. Then there are 30 million in the 11th and 12th standards. There are nearly 18,000 colleges at the degree level and nearly 25,000 at the level of 11th and 12th standards. Very few of the colleges have broad-band connections, or even basic Internet connectivity, with the possible exception of dial-up. They would not be able to take for granted the availability of broad-band connectivity with adequate bandwidth for years to come. PC penetration and Internet penetration are still much lower than what they need to be to meet educational objectives.

The HP Educenter Project

Having recognized that educational TV holds immense potential in the Indian scenario, HP Labs India launched this project, aimed at creating a working system that can be installed in Indian colleges. The system will provide a solution for capturing, storing, editing and using multimedia in the educational process.

One significant challenge faced in this project was sending of video, metadata and multimedia content through TV channels which reach everywhere. Particularly attractive is the use of DTH, which offers high quality channel access at very low costs. Such channels deliver data in parallel with video and audio content in the mpeg format.

The data carried has to serve multiple purposes: to distribute schedules in a machine readable form, ideally as *.xml files to enable automatic video capture and storage, to distribute metadata describing the content for organized storage, search and retrieval of content, and to distribute presentation and text files, for instance, *.ppt files and *.doc files. Another function of the data would be to describe a number of sub-topics being covered in a TV program, giving them names and indicating their position within a program. This will facilitate the work of staff, who would cut the program into video clips for use in multimedia presentations.

The project has been successful in creating a system that can be set up in college/university campuses to provide video-on-demand on-campus service based on educational TV. This is illustrated in Figure 1. The capture device can encode the incoming TV programs into a suitable format and store them in the digital library.
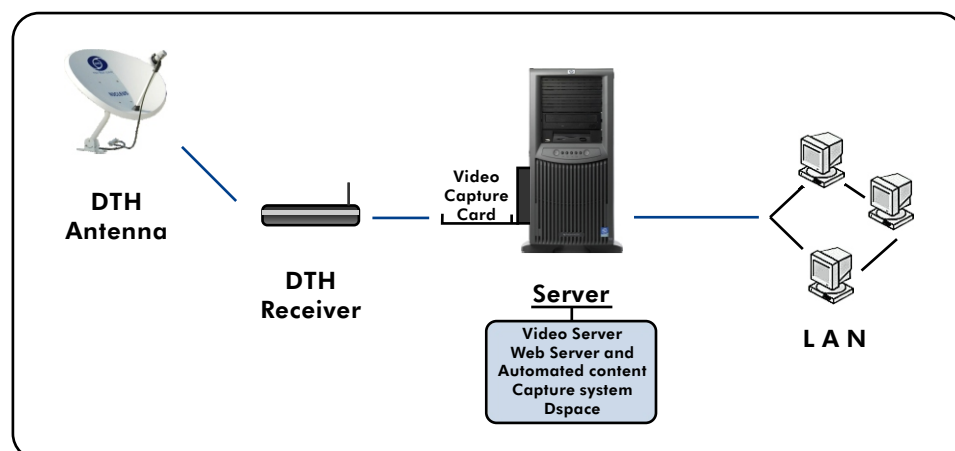
Figure 1

Note: "Educenter" is only an internal project name, and is not an HP Trademark.

These programs can then be accessed through a digital library application that runs on the server. The student does not have to bother about keeping track of TV schedules, or waiting for the right kind of programs. A lecturer can suggest certain videos to be watched as a part of course-work, or the student himself can search the digital library to find programs that would facilitate his learning. A built-in search engine available with the digital library makes this easy. In addition to viewing presentations over an Institution's LAN, we can offer other facilities to students. For instance, if the LAN is WiFi enabled, students having laptops would be able to easily download presentations for later use.

DSPACE Digital Library

DSpace is a digital repository system that captures, stores, indexes, preserves and redistributes an organization's research material in digital formats. Research institutions worldwide use DSpace for a variety of digital archiving needs -- from institutional repositories (IRs) to learning object repositories (LORs) and electronic records management. DSpace is freely available as open source software. An active community of developers, researchers and users worldwide contribute their expertise to the DSpace Community.

Dspace can be installed and customized extensively to suit the needs of the host organization. Installation can be carried out on a Linux-based server that sits on the campus LAN. It can be used to collect and archive a variety of academic material. DSpace accepts all forms of digital materials including text, images, video, and audio files. This content can be "submitted" (that is, put in) to DSpace by any user who has the required authorization to do so. In a college scenario, the faculty would have such privileges. There is also an administrator, who has the privilege to accept, catalogue and edit such submissions. This could be a library staff member of the college. Once up and running, DSpace can be accessed by the users through a web browser.

Dspace has been chosen as the information repository of choice for the HP Educenter Project.

For More Information Contact

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