

Hyper Video for Distance Learning

Mario Bochicchio

University of Lecce, Italy

Nicola Fiore

University of Lecce, Italy

INTRODUCTION

In general, the production of hypermedia applications is a complex and expensive task, requiring both technical skills and communicative abilities (Bochicchio, Paiano & Paolini, 1999a, 1999b). Nevertheless, some specific kinds of multimedia production can give good quality results, even without specialized IT skills, at a low cost. We have concentrated on this particular field, with the goal of supplying a valid tool to teachers who want to publish their educational material easily and at a low cost.

It is easy for a good teacher to give a lesson and to explain concepts using images and slides to show objects, to write on the blackboard, and to use his body language to grab and hold the attention of his students.

In our opinion, these kinds of lessons can be effortlessly transformed into very usable and effective multimedia applications based on the video of the lesson, on a simple and regular navigation structure, and on a little set of user-friendly multimedia objects.

BACKGROUND

Various research and commercial tools, such as GRiNS (2001), MTEACH (Montessoro & Caschi, 1999), Video Madeus (Roisin, Tran-Thuong & Villard, 2000), and Real Presenter (PresenterPlus, 2001), are based on this assumption, but their effectiveness is limited by a number of issues:

- their technical complexity makes them unsuitable for a large number of teachers with low technical aptitude;
- in general, they are more data-driven than user-centered;
- the time and the budget needed for a non trivial production (e.g., a course of 10 hours or more) can be remarkable; and
- they are often limited to specific lesson styles (e.g., a frontal lesson based on MS PowerPoint presentations).

Moreover, it is well known that long video sequences (e.g., 1 hour or more) are not compelling and not interactive, and the usual linear cursors and VTR-like controls can be ineffective for navigating video sequences longer than a few minutes.

To solve these problems we created LEZI, an experimental tool oriented to the very easy production of video clips enriched with hierarchical indexes, hyper-textual elements and other multimedia objects (hypervideos).

LEZI PROJECT: REQUIREMENTS

An accurate analysis of both research and commercial tools permitted us to extrapolate the essential requirements of a good development environment based on indexed video.

Starting from these requirements, a LEZI prototype was developed at the Hypermedia Open Center (HOC) of the *Politecnico di Milano*, and a number of real lessons were produced and tested (Bochicchio, Paiano, Paolini, Andreassi & Montanaro, 2000). A project for a more complete prototype, called LEZIII, was then started at the SET-Lab of the University of Lecce, within a large research project focused on the development of innovative educational tools and applications.

The first fundamental requirement for LEZI is that it be very easy to use, so that it can be truly accessible even to users with very basic computer knowledge.

The second, even more important requirement is to keep production times down (ideally to about one hour of work or less for each hour of the lesson). In some cases (e.g., conferences or special events), it may be important to extend this constraint up to the “real time production” limit (i.e., the indexed hypervideo of the event should be available on CD/DVD, and online, by the end of the event itself!).

A third very important requirement is the ability to effectively support the most common “authoring situations”, like those in which a teacher:

- presents his lesson in a classroom, with a blackboard, or outside the classroom (on the field), if this is appropriate for the topic concerned;
- uses gestures to “animate” some concept expressed by “static schema” (typically a slide), so that students need to simultaneously view the two different information sources (the teacher and the schema);
- uses his PC to explain how to use a specific computer program when the attention focus is on the display of the PC, on the voice of the teacher and, optionally, on a blackboard; and
- uses his PC to make a PowerPoint presentation. The attention focus is on the display of the PC and on the voice of the teacher.

The fourth requirement relates to finding the various topics and subtopics in the lesson. The user needs a fast and effective way to find out the contents of the video lesson, so they can easily find and reach the subjects of interest without wasting time on uninteresting or already-known video sequences.

We maintain that the most common video players (Real Player, Microsoft Media Player and QuickTime player) generally do not offer an adequate solution to this problem.

The fifth requirement concerns the technical skills needed in the authoring phase; it is important to have a high-level authoring tool to simplify all technical tasks and to fully support teachers and lecturers, whatever technical knowledge they may have.

A final requirement concerns the possibility of linking suitable comments, bibliographic references, and other teaching materials to the indexed hypervideo. The most common digital document formats (PDF, HTML, PPT, etc.) should be supported.

CONCEPTUAL MODELING

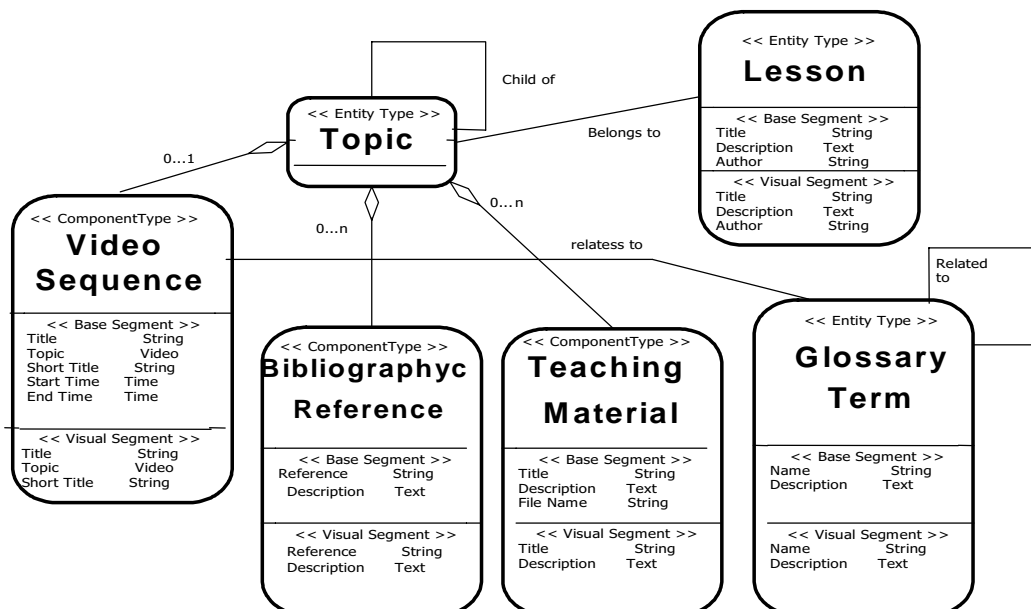
The W2000 (Baresi, Garzotto & Paolini, 2001) methodology has been adopted to refine the informal description presented so far, to obtain a suitable conceptual model for LEZI II, and to derive from it the current LEZI II prototype.

W2000 is a user-centered methodology for conceiving and defining hypermedia applications. It organizes the overall development process into a number of interdependent tasks. Each activity produces a set of related diagrams which describes some aspects of the hypermedia application, and is based on UML. The idea underlying W2000 is a requirements-driven, user-focused approach to design.

In brief, for the LEZI prototype we have identified the following roles:

- *Author*: manages his public/private lessons and related students;
- *Registered Student*: attends public/private lessons and can perform second level authoring (co-authoring) operations (Garzotto, Mainetti & Paolini, 1995).

Figure 1. LEZI II: Hyperbase in the large



4 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:

www.igi-global.com/chapter/hyper-video-distance-learning/14439

Related Content

Flexible Job-Shop Scheduling Problems

Imed Kacem (2005). *Encyclopedia of Information Science and Technology, First Edition* (pp. 1197-1200).

www.irma-international.org/chapter/flexible-job-shop-scheduling-problems/14410

Information Architecture: Case Study

Cláudio Roberto Magalhães Pessoa, Monica Nassif Erichsen, Renata Maria Abranches Barachoand George Leal Jamil (2016). *Handbook of Research on Information Architecture and Management in Modern Organizations* (pp. 424-438).

www.irma-international.org/chapter/information-architecture/135779

Managing an Engineering Project

Nayem Rahman, Alexis Wittmanand Sallam Thabet (2016). *International Journal of Information Technology Project Management* (pp. 1-17).

www.irma-international.org/article/managing-an-engineering-project/143118

Portable Portals for M-Commerce

Irvine Clarke Illand Theresa Flaherty (2005). *Encyclopedia of Information Science and Technology, First Edition* (pp. 2293-2296).

www.irma-international.org/chapter/portable-portals-commerce/14601

Thematic Analysis of User Experience of Contact Tracing Applications for COVID-19 Using Twitter Data

Mariam A. Alterkait, AlJawhara Owaid Almutarieand Manal Y. Alduaij (2024). *Journal of Cases on Information Technology* (pp. 1-22).

www.irma-international.org/article/thematic-analysis-of-user-experience-of-contact-tracing-applications-for-covid-19-using-twitter-data/335946