ABSTRACT

This paper introduces the main features of LEZI, a software tool oriented to the production of indexed videos (hypervideos), enriched with hypertextual and multimedia elements. In certain types of educational applications, the quality of educational content may compensate easily for a user interface limited to the essentials or a reduced set of multimedia features. Production of this kind of multimedia application can be high quality, even with short production cycles, at a very low cost. This work concentrates on this particular field with LEZI, a conventional conference/lesson that can be transformed effectively into a powerful multimedia product based on a very simple and regular structure. The authors hope that the LEZI environment, which does not require specific expertise in information technology, will allow the author of an educational multimedia product to work at a higher level than conventional authoring tools in a short time and at a low cost.

Keywords: distance learning; hypermedia technologies; Web-based learning

INTRODUCTION

In general, modern multimedia applications are complex to conceive and design, and their development process can become rather expensive in terms of time, knowledge, specific techniques, complex graphics, animation, and high-quality video and audio (Bochicchio, Paiano & Paolini, 1999). Attempting to reduce costs or to shorten production time easily may result in poor quality (Garzotto, Mainetti & Paolini, 1995).

Nevertheless, in certain types of educational applications, the quality of educational content easily may compensate for a user interface limited to the essentials or a reduced set of multimedia features. The production of this kind of a multimedia application can be high-quality, even with short production cycles, at a very low cost.
This work concentrates on this particular field, with the aim of supplying teachers with a valid tool for publishing their educational material easily and at a low cost.

Good teachers, obtain and hold the attention of their students by speaking, using images and slides to explain, showing objects, writing on the blackboard, and using gestures. Then, traditional lesson/conference presentations can be transformed easily into good-quality multimedia applications for both online (Web) and disk-based (CD/DVD) distribution.

This paper describes the main features of LEZI, a software tool oriented to the production of indexed videos (hypervideos) enriched with hypertextual and multimedia elements. Our idea was that, just as a book needs a hierarchical index to allow readers to find a topic without needing to read it in its entirety, the video of a lesson can be supported by a hierarchical index to enable students to find the part of the lesson in which they are interested.

In the Related Works and Commercial Products section, we define the position of our work in relation to the literature and existing products. Further sections deal with the requirements, the conceptual modeling, and the main implementation issues of the proposed tool. A description of the LEZI prototype is given in the LEZI II Prototype section, while one full-working example of hypervideos developed for real university classes is given in the Sample Application section. Finally, we present our conclusion and we discuss future developments.

RELATED WORKS AND COMMERCIAL PRODUCTS

In recent years, international workgroups have defined standards (e.g., SMIL, HTML+Time, etc.) and developed tools to design, model, and produce interactive hypermedia applications based on multimedia objects with temporal synchronization requirements (i.e., animation, video, etc.).

In our opinion, these tools, well defined from the theoretical point of view and very effective in terms of results, are often complex and unsuitable for people with low technical aptitudes. Simplicity and user-friendliness are fundamental in the environment of teaching in order to enable teachers and scientists to publish educational material with limited economic resources and without specific technical skills.

An interesting example is GRINS, an authoring product for creating and executing hypermedia SMIL documents. In general, GRINS needs a great deal of detailed information on the space-temporal aspects of the presentation, which increases the versatility and flexibility of the tool but requires technical skills and implementation abilities that the non-specialist may not have.

MTEACH (Montessoro & Caschi, 1999) is based on a different approach: it is an authoring methodology supported by a language and a compiler, which allows the authors of educational hypermedia products to work at a high level. MTEACH aims to simplify the design and development phases of educational applications by adopting predefined application templates. Nevertheless, it does not cover a number of interesting authoring occasions, as defined in the next section of the paper.

The VideoMadeus authoring tool (Jourdan et al., 1998; Roisin, Tran_Thuong & Villard, 2000) is based on a model for the description of audiovisual information, as shown in Figure 1. VideoMadeus focuses on the interaction of video elements (character, slot, scene, etc.) with other elements (text, sound, etc.) in a multimedia document.
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