ONLINE INFORMATION AND INTERACTIVE VIDEODISC TECHNOLOGY: CASE PRESENTATION ABOUT PROJECT EMPEROR-I*

Ching-chih Chen
Simmons College, Boston, Massachusetts, USA

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Abstract: This brief paper describes how interactive videodisc technology has been applied to present and interpret one of the world's most significant and popular archaeological finds in China. Since multi-media, multi-formatted and multi-dimensional information are involved, this project has been an ideal R&D project to demonstrate fully the great potential of interactive videodisc technology for information storage, processing and retrieval, including interactive online retrieval. Actual demonstration of the videodisc, The First Emperor of China, will be given during the session.

1. INTRODUCTION

"PROJECT EMPEROR-I: China's Treasure Revealed via Videodisc Technology," which is supported by the Humanities Project in Libraries, U.S. National Endowment for the Humanities, applies the latest in videodisc technology in order to present and interpret a major historic/archaeological period of China's past. The site and artifacts to be recorded and presented are from the period of the First Emperor of China, including the terra-cotta figures of warriors and horses near his tomb in Xian (see Figure 1.)

2. OBJECTIVES

In addition to position the videodisc as a serious medium for information storage, processing and retrieval, PROJECT EMPEROR-I is a project aimed at wedding humanistic applications and new communication technologies. It demonstrates how new technologies can help to enhance better understanding and appreciation of humanities by delivering online multi-media, multi-formatted and multidimensional information in a way not possible before. Similar applications can be inferred for other subject disciplines.

3. PHASES

PROJECT EMPEROR -I includes numerous phases of work, which can be roughly summarized as follows:

A. Planning and basic data collection phase;
B. Production phase;
C. Post-production phase;
D. Courseware design phase;
E. System evaluation and dissemination phase.

4. PROJECT PRODUCTS AND SYSTEM (S) USED

The end-products can be categorized mainly as follows:

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A. The first product consists of two completed 12-inch CAV videodiscs (four sides altogether), entitled "The First Emperor of China: Qin Shi Huang Di, 秦始皇帝" Each side of the discs contains 54,000 frames of visual images, and two 30-minute audio sound tracks in both English and Chinese. The visual images include over 200 segments of motion video from films and videotapes, over 4,000 still frame slides, and videotaped interviews with ten subject experts. This visual information is stored on disc in such a way by grouping it in various "chapters" like an electronic book, accompanied by audio narrations in both English and Chinese. Most of the chapters are conveniently divided by images on artifacts and collections from various major museums in China, or video-segments on places and facts related to the First Emperor of China, or experts' answers to questions videotaped during interviews with them. Aside from small segments of the discs - such as a 10-minute introduction on the First Emperor of China, a 5-minute introduction on the Great Wall, and a 7- or 8-minute introduction to the excavation of the terra-cotta figures - which can be viewed as somewhat self-contained units, this set of discs is not intended to be used as stand-alone discs.
Hardware required: To utilize these videodiscs on the most basic level, in other words, simply to have access to either a certain frame (s) of visual image (s) with accompanying audio information, only a videodisc player for NTSC CAV disc is required. In our case, a SONY LDP1000A is used. This is an industrial model which can search and retrieve any one of the 54,000 frames of visual images by frame number via an efficient index in about three seconds. Any one of these frames can also be frozen for in-depth discussion at the user's own pace. Chapter search can also be conducted as easily as the frame search.

B. An electronic database with each database record consisting of multiple fields, is being created for each of the visual images on the disc. The database construction work is in progress and most of the present work is still involved mainly with research and data collection. The software to be used is yet to be finalized, and it will probably be a hierarchical relational database, such as the Microcomputer Picture Archive and Communications System from Artam Ltd. Once the database is computed, the information stored on this electronic database together with visual images on disc can be Boolean searched via a microcomputer. Both visual and textual information can be retrieved by each of the searchable fields of the database record.
System Used: This electronic database will be built by using the Digital Equipment Corporation's Interactive Video Information System (IVIS)'s Professional - 350 microcomputers. A powerful hierarchical relational database management software will be chosen soon. In addition to being able to run on IVIS, versions for other popular microcomputers, such as IBM/PC or IBM/XT, should be available as well.

C. Several coursewares in interactive use of our videodisc with DEC's IVIS system will be designed for at least three different levels of users, for example, the general public, college students and specialists. For each courseware, it is anticipated that about eight to ten hours of computer assisted instructional lessons will be devised for the system users at a given level. Each lesson will be presented in a few hundred screens, in which menus, sub-means, graphic overlay, windowing, branching capability, etc. will be featured and programs will be written to present textual, graphic, visual and audio information in whatever combinations deemed most appropriate for question(s) and/or choice(s) selected by the system user.
System Used: DEC's Producer courseware authoring system will be used to develop these courseware programs, coupled with the use of other powerful DEC's software, such as Synergy for windowing capabilities and Site for graphic overlay, etc. Once the courseware programming is completed, it can be run on DEC's IVIS together with the use of the videodiscs. In order to ensure the portability of the micro-based system, coursewares will also be developed for popular microcomputers, such as IBM/PC and IBM/XT.

5. CONCLUSION

This project is demonstrating the enormous capability of videodisc technology for its high-density storage of information, quick random access and easy retrieval of the high density multi-media, multi-dimensional, and multi-formatted electronic information stored on a videodisc.

While the videodisc can be searched randomly and almost immediately, its online information retrieval can be greatly enhanced through the interactive use of videodisc and microcomputers. PROJECT EMPEROR-I is a perfect illustration of how online retrieval of visual, audio and textual information on disc as well as database information stored on a micro-based system can greatly enhance the future of information provision and delivery. Because both the visual and electronic databases can be utilized in many different ways, depending on the persons designing the finished products and retrieving the data, this combination of use of new technology has created new excitement in information retrieval and learning.