HBS EPIC

The April 25 meeting of the Special Interest Group for Applications Development featured Gwen Weaver of the Harvard Graduate School of Business Administration describing HBS EPIC (Educational Products Information Collection), a series of projects to provide many kinds of academic information at the desktop.

HBS EPIC, a three-part concept for making available on line some of the School's resources as well as outside business information, has been a two-year on-going effort. When finished, it will include electronic access to information owned or produced by the Business School, such as cases, articles from the *Harvard Business Review*, and library information; business information from such sources as CompuServe or Dow Jones; and office productivity capabilities, such as electronic mail and information exchange features.

The project, which now includes text and graphics capabilities, is intended to provide a window to the Business School environment, and its developers hope to include multimedia capabilities as well. Faculty advisor to the project, James Cash, is helping the community identify and select appropriate information to be included and to suggest automated Faculty advisor to the project, James Cash, is helping the community identify and select appropriate information to be included and to suggest automated support tools for obtaining the information.
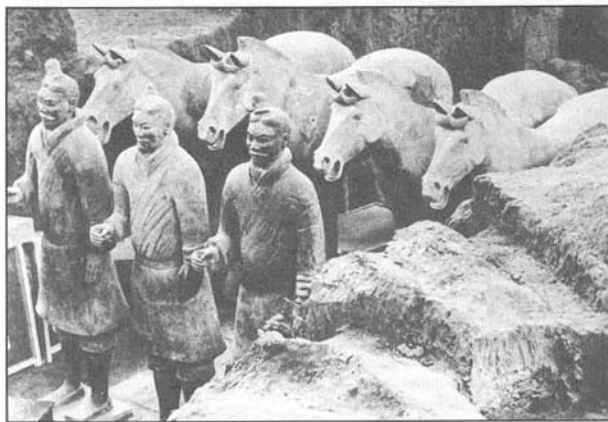
In addition to Professor Cash, the EPIC task force consists of six Business School representatives from different areas: computer services, microcomputer support, publishing, the library, and the academic support services, as well as project teams working on individual efforts. The task force, which meets every 4-6 weeks, currently has 23 individual projects in various stages of development. These include baseline

Terra-cotta figures from the tomb of Emperor Qin Shih Huang Di. Photograph courtesy of Robin Yates and PROJECT EMPEROR-I.

Emperor-I: *Interactive Videodisc Technology in Chinese Studies*

"PROJECT EMPEROR-I: China's Treasure Revealed Via Videodisc Technology," recreates in electronic form marvels from the 22-century-old tomb of China's first Emperor, Qin Shi Huang Di. Using interactive multimedia videodisc and microcomputer technology, members of the project are making form marvels from the 22-century-old tomb of China's first Emperor, Qin Shi Huang Di. Using interactive multimedia videodisc and microcomputer technology, members of the project are making accessible to students, scholars, and the general public one of the most spectacular archaeological discoveries of this century. The discovery of the tomb, with row upon row of life-size pottery warriors standing silently in the yellow loess soil surrounding it, has become one of China's major tourist attractions. Since they were unearthed in 1974, some of the pottery figures have travelled across the world, drawing hundreds of thousands of visitors.

The multimedia project, directed by Dr. Ching-chih Chen, Professor and

Associate Dean of the School of Library and Information Science, Simmons College, and with major grants from the National Endowment for the Humanities as well as Simmons College, consists of two stages, one for gathering data and videodisc production and the other to develop applications for interactive National Endowment for the Humanities as well as Simmons College, consists of two stages, one for gathering data and videodisc production and the other to develop applications for interactive courses.

Two 12-inch videodiscs, each containing 108,000 frames as well as audio were produced as a result of the data-gathering. To produce the discs, project members interviewed Chinese specialists about the Qin finds and reproduced archival film footage from the original excavations. In addition, the disks contain all relevant illustrations published in China, supplemented by interviews with project consultants Professors Kwang-chih Chang of Harvard's Department of Anthropology

Magnetic Resonance Imaging:
A Marriage of Technolgies for Medical Diagnoses

Magnetic resonance imaging (MRI), a revolutionary technology for revealing body tissues with greater clarity than conventional imaging techniques, uses a magnetic field, radio waves, and computers to show subtle differences in tissue density and function. Compared to the two other principal diagnostic imaging methods, X-rays and CAT (computerized axial tomography) scans, MRI has other advantages as well.

With the aid of X-rays, in use since the turn of the century as the workhorse of modern medical imaging, physicians have been able to discern gross differences in soft tissues, but the technology cannot "see" through bone or other hard objects. The introduction of CAT scans in the early 1970s enabled more subtle differences in soft tissues to be revealed. But the discovery of nuclear magnetic resonance (NMR), now called MRI, in the early 1970s enabled more subtle differences in soft tissues to be revealed. But the discovery of nuclear magnetic resonance (NMR), now called MRI, allowed physicians to see the exquisite discrimination between normal and pathologic tissues disclosed through the use of chemical and physical parameters unique to this technology. Not least, MRI does not require painful, invasive diagnostic procedures, nor does it deliver unwanted radiation.

Unlike X-rays, which are based on static images, MRI works with differences in density and behavior of mobile nuclei in the body. To create an image, the body is placed in a magnetic field

Medical Knowledge Navigator

Exploring the sea of knowledge and charting discovery paths through it can be formidable for practicing physicians who need to make informed but rapid health care decisions every day. Physicians are inundated with information: in daily practice they must assimilate and analyze patient data and then decide what treatment to undertake. Their judgments must take into account knowledge of physical functions, costs, risks, benefits, and other complex details. Computer technology now offers a system to facilitate organizing, accessing, and applying all this complex knowledge to help solve medical problems.

Dr. Robert Greenes, who gave the final OIT colloquium in this year's series, is Director of the Decision Systems Group at Brigham and Women's Hospital, a group currently developing a prototype knowledge environment for incorporating a variety of knowledge resources by means of an object-oriented program design. Known as Explorer-2, the desktop knowledge environment is able to access and link diverse forms of static as well as

dynamic knowledge: narrative text, diagrams, and images; and simulations, inference procedures, and other specialized analyses and presentations of data.

Software that enables browsing and navigating through such an environment, as well as having expert system problem-solving capabilities, needs to provide a consistent interface, a uniform

Dr. Robert Greenes, whose Decision Systems Group at Harvard Medical School developed Explorer-2.

From the Director

In the early 80s, the wave of new home computer game products provided an impetus for the personal computer industry. By the middle of the decade, the IBM personal computer was to be found everywhere, in industry as well as at the university. With Apple's $1,000 Macintosh distribution program in the fall of 1985, that machine received such popular acceptance that it became a common scholar's tool. This spring the first wave of Macintoshes purchased by freshmen will graduate.

Over the last four years not only has the typewriter been replaced by the personal computer, but many problems that used to be solved using mainframe-based timesharing are now done at the desktop. While there will always be a supercomputing or super data server role for the mainframe or mini, information technology has undergone a major revolution in a few short years.

We predict a similar revolution will take place for next year's freshmen, who will graduate in 1994, the 50th anniversary of the Mark I (the first computer at Harvard). This next revolution of computer communications has already impacted other institutions and is beginning to affect Harvard. By 1994, everyone here will be able to send computer messages or files as well as log on to remote computers.

We are now engaged in wiring the campus to enable this "well connected" future environment. Students graduating in 1994 will likely be able to communicate electronically with each other, with colleagues elsewhere, and with scholarly information services. Many departments will have new research tools, electronic kiosks and information services, and more library and bibliographic information commonly accesssible over the University Network.

Stephen C. Hall
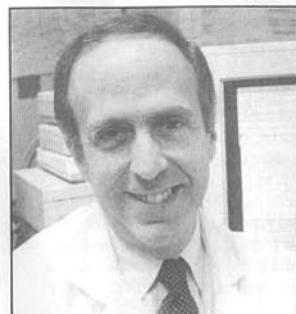
ARTFL French Data Base Available at Harvard

For scholars, words are often the engines of thought. Researchers, scholars, and students at Harvard who work with French words now have an opportunity to use a computerized version of three centuries of French texts, including 150 million words. The nearly 2,000 texts, part of a data base project jointly developed by the University of Chicago and the *Centre National de la Recherche Scientifique*, contains a broad range of written French, from novels, verse, journalism, essays, and correspondence to treatises, including literary criticism, biology, history, economics, and philosophy.

Begun in 1981, the Project, called the American and French Research on the Treasury of the French Language (ARTFL), has also developed an interactive textual analysis package for accessing and using the data base. *PhiloLogic*, the name of the access and retrieval package, is menu driven and includes a help system. The ARTFL Project has also written full documentation for *PhiloLogic*, including tutorials for logging on and printing.

Options available on the on-line data base include single-text searches, texts by a single author, texts from a given time period, keyword and logical or associative word combination searches, or queries covering all the texts in the system. Results can be displayed as concordances (individual words and their occurrences in particular texts), as well as blocks of text or bibliographic information and page references. Sorting by date, author, title, and keyword is equally possible.

ARTFL Project members expect to expand the data base to include corrections of existing texts as well as continued development of access and analysis software. In addition, the project welcomes new contributions and proposals for further expansion in the area of texts and software tools to facilitate analysis. To contact the Project, please write to the American and French Research on the Treasury of the French Language, Department of Romance Languages and Literatures, University of Chicago, 1050 East 59 Street, Chicago IL 60637 or call (312) 702-8488.

A University-wide site license to use ARTFL's *PhiloLogic* and *MacPhilo* (the Macintosh version) to access and work with the data base has been arranged with the assistance of Lewis Law, Director of Computer Operations of the Faculty of Arts and Sciences. The package is expected to be available from the early part of June. Access can be obtained at no cost from terminals or personal computers with connections to the Internet, or at normal telephone rates for dialup access via modems. For further information or login instructions, please call Lew Law at 495-2627. (Information for this article was provided by Lew Law.)

Kennedy School Political Simulations

What flight simulators do for aspiring pilots, the Kennedy School's *Harvard Campaign Games* will be able to do for managers and candidates of political campaigns. The gaming simulations will help those responsible for running such campaigns improve their skills without having to risk disastrous real-life consequences of poor decisions.

When completed, the *Games*, a project of the Strategic Computing and Telecommunications Program at the Kennedy School of Government, will be a series of ten simulations using videodisc technology to enable players to make political action choices on the basis of available information.

Jerry Mechling, Director, and Tom Fletcher, Associate Director of the program, envision the simulations as useful for teaching political managers to identify and turn particular situations to their advantage, as well as helping them to minimize potential destructive consequences.

Computer-based tools will allow the simulations to provide feedback on skills like dealing with the press, producing media events, and interpreting polling or targeting information through analysis of survey and electoral data and precinct mapping. The tools will also provide data base management, predictive modeling, and media strategy design capabilities. Current plans are to develop the simulations with HyperCard and Apple technology, which will provide a transparent student interface for the lessons.

The visual dimension of interactive video technology and its accompanying audio track establish a multisensory relationship, as well as permitting students to determine the speed, direction and subject matter of each session. These capabilities promote direct, active participation and enthusiasm for the learning experience.

By taking advantage of the technology's branching capabilities, the simulations will provide many possible combinations of response paths, enabling students to see the consequences of their political decisions. To add to the impact of the learning experience for professionals, the developers of the games plan to use excerpts from interviews with experts in politics and the media for direct, individualized feedback.

In addition to their tendency to enhance motivation, simulations offer greater likelihood that learning will be transferred than do conventional drills, tests, or tutorials. With their intensified, accelerated recreations of real-life situations, videodisc simulations are especially suitable for adult learning situations. Developers of the *Harvard Campaign Games* expect the project will prove very useful to students and would-be political managers.

For more information about the simulations or the technology being used to develop them, please call Tom Fletcher at 495-3036.   *Tom Fletcher*

Business School

projects, information that is necessary to make HBS EPIC a reality, and experimental or prototype projects, including information that gives added value to the project and is often revised on the basis of members' input.

For example, one important baseline project, to provide on-line access to the School's business case studies, may also facilitate distribution of paper copies of the cases. The studies, which now consist of 6-7,000 active cases, with 60-70 being added every year, are not only used by students at Harvard but by many other universities and corporations as well. The ability to send case files to the printer electronically would greatly facilitate paper production; the ability to distribute the cases over a network, once storage and licensing issues are solved, would greatly simplify transfer to other universities and would also considerably reduce the cost of making the cases available.

A prototype CD-ROM disk was created last year. Another project being investigated is the use of optical storage media. As a prototype for this project,

the group is planning to put the School's building plans on disk to enable the planning office to access historical information and current updates to facilitate maintenance and changes.

The object of the task force is to create a system that is driven by the people who use it. HBS EPIC now exists in a version for personal computers and for the mainframe. The PC version, being used with IBM PS/2 systems, includes Lotus (for producing case software spreadsheets), two word processing packages, Dow Jones News & Retrieval, CompuServe, the Baker Library catalog, a Prodigy demonstration (a new graphic, consumer-oriented, on-line magazine), and other software. The mainframe version, which can be used with any terminal emulation package, includes access to electronic mail, the Baker Library catalog, CompuServe, and several system utilities.

For more information about the project, please call Gwen Weaver, Director of Information Resources at the Business School, at 495-6043.

Project Emperor

and Robin D.S. Yates of East Asian Languages and Civilizations.

Burnt into the discs by laser, the audio information is in Chinese and English. The accompanying visual images are in the form of motion pictures and more than 5,000 still slides. Including an introduction to Qin history and the archaeological discoveries, as well as an overview of the Great Wall, the discs also contain museum photographs, a slide library, archival film, and interviews with specialists. The interviews constitute a unique oral history, for the scholars' responses to issues raised by the finds cannot be found anywhere else.

While the discs can be played continuously, each frame or chapter can also be individually searched and retrieved. A feature that greatly enhances its value for study and research is the ability to stop, start, or replay the video at will.

The second stage of the project, begun in 1985, is still in progress. It includes development of interactive courseware for different system configurations that draws on the visual and audio data as well as other information, such as texts from additional interviews, translations of archaeological reports, and Chinese historical records.

With the availability of HyperCard, project developers are taking advantage of its programming language, HyperTalk, for rapid multimedia information retrieval. This, combined with an Apple donation of ChineseTalk, enabling menus in Chinese as well as English to appear on screen, is allowing the development of two levels of courses based on outlines by Yates. One contains general information, and the other, including extensive discussion of the mausoleum excavation, technology, art, architecture, weapons, armor, and hairstyles, is interactive and will be in Chinese and English.

Improvements in image quality are now being studied, with the assistance of Sun Microsystems, and new techniques in electronic imaging and high-resolution digitization show promise as tools for research into the archaeological data.

PROJECT EMPEROR-I, a pathbreaking research and development effort, is one example of the integration of advances in technology with instruction in the humanities, social science, and science. It also shows how technology can help disseminate new and relatively inaccessible knowledge, even to those with little or no computer training. As a powerful learning tool, the interactive capabilities of the technology allow students and researchers to have direct visual and aural contact with the artifacts they are studying.

Robin D.S. Yates, Harris K. Weston
Associate Professor of the Humanities