The Emerging Global Library


What information and procedures should you "memorize" and carry around in your head? What should you carry with you, perhaps in your appointment book, wallet, or personal digital assistant (PDA)? What should you have readily available where you work or study, on your personal computer or in your personal library of reference books and CD-ROMs? What should you be able to access through the local and wide area computer networks that connect our emerging Global Library?

As a final question, what is your opinion about the following statements:

• The answers to the previous questions do vary and should vary with the person providing the answers.
• Our educational system should accommodate and build on the diversity reflected in the varying information needs and information-processing abilities of individuals.
• The answers to these questions are changing along with the changes in the information technologies.

Global Library

I read a lot of science fiction. I recently read the Uplift trilogy written by David Brin. In this trilogy, races in five of the galaxies in the universe have been traveling in space for about three billion years. These races gain prestige and power by identifying emerging sentient-races that have the potential to learn space travel technology and to join the other space-traveling races of the galaxies.

A central theme in the trilogy is the Galactic Library—a multibillion-year accumulation of knowledge developed by a huge number of different races. David Brin explores the value of this library and its effects on emerging sentient races. For example, what is it like to be a research scientist or engineer when you are suddenly made aware that the problems you are working on were solved a billion years ago? What is it like to be a "backwater" race and not be able to afford a full copy of the Galactic Library? What problems should you be attempting to solve without reference to the Galactic Library, and to what extent should your world's technology and science be dependent on the Galactic Library?

These are interesting questions, all of which are essentially the questions we should be asking ourselves as our Global Library emerges.

Declarative and Procedural Knowledge

It is helpful to divide memorized information into two major categories: declarative knowledge and procedural knowledge. Declarative knowledge includes facts or pieces of information, such as the names of the countries of the world and their capital cities. Procedural knowledge tells how to do things. For example, a touch typists mind and body rapidly and accurately carry out the typing process, with little or no conscious thought.
The human mind can memorize or learn a great deal of declarative and procedural knowledge. Computers add a new dimension to declarative and procedural knowledge because they can store virtually unlimited amounts of declarative knowledge. A computer rapidly and accurately carries out a procedure defined by a computer program. The procedure may graph data, solve equations, or browse the Web for information about a particular topic. Examples of computers using procedural knowledge can be seen in robots, automated factories, autopilots in airplanes and space vehicles, and automated equipment in science laboratories. More mundane examples can be seen in the spelling checker in the word processor you use and in math software that can automatically solve a huge range of problems.

**Different Levels of Libraries**

At the beginning of this editorial, I asked four questions relating to our personal levels of information access. Each of these questions corresponds with one of the following "levels" of libraries:

1. **Internal Personal Library**—one's own memory. This includes knowledge about the capabilities, limitations, and contents of the other libraries, as well as the skills necessary to use them.

2. **External Personal Library**—the tools we routinely carry with us. The steadily increasing power of portable computers and PDAs is greatly increasing the scope of what we can carry.

3. **Personal Library**—the tools we use on a regular basis but cannot easily carry with us, such as a home computer system or a large collection of reference books.

4. **Worldwide Library Networks**—local, regional, and global electronic reference sources.

All four levels of libraries are dependent on the memory, knowledge, skills, and intelligence of the user. Computer technology is steadily increasing the power, ease of use, and accessibility of the latter three levels. For example, cellular telephones and portable modems make it possible for us to have ready access to our personal libraries and local, regional, and global library networks. The growing possibilities for wired and wireless connectivity are leading to a gradual merger of people's External Personal Libraries and Personal Libraries with Worldwide Library Networks into a Global Library.

**Educational Implications**

The challenge to our educational system is two-fold. First, our educational system needs to provide students with appropriate access to the emerging Global Library and instruction in its use. Every student needs to become a competent research librarian. Second, curriculum, instruction, and assessment must be consistent with and supportive of the emerging Global Library. Less emphasis should be placed on tasks that a computer can perform far better than a person, and increased emphasis should be given to the things that a person can do far better than a computer.

Special attention needs to be paid to individual differences—to diversity. People vary tremendously in their abilities to memorize declarative knowledge. People vary tremendously in their abilities to memorize procedures and develop speed and accuracy in carrying them out. Our
educational system is committed to accommodating such individual differences for students with certain specified handicapping conditions. A logical next step is to better accommodate such individual differences among all students.