

CD-ROM - An Information Storage and Retrieval Tool

R.S. SHARMA and RACHNA PATNAIK

Library, Space Applications Centre, ISRO, SAC P.O., Ahmedabad - 380 053

Abstract

Information Retrieval is becoming increasingly dependant on physical mechanisms like computer, telecommunications, Multimedia, CD-ROM, Internet, WORM, modem etc. Among these the CD-ROM databases are cost-effective. Due to advancement of electronic sector more and more users are using CD-ROM for retrieving information as it follows Hypertext system. They are unique because large volumes of data can be stored at a very low price. The information contained in CD-ROM include text, still images, audio, digital video and animation. The authors mention about the advantages of CD-ROMs and provide the status of CD-ROM server at SAC Library, ISRO.

Introduction

Information retrieval is the process of selecting information from a storage media in response to the queries received from the end-use. The process is becoming increasingly dependent on physical mechanisms like computer, telecommunications, Multimedia, CD-ROM, Internet, WORM, modem , etc.

Previously, jobs i.e. queries were submitted in batches and then they were processed but now with the advancement of technological tools users can retrieve right information online on a particular subject area using various search techniques. Efficient storage and retrieval of reliable information are of crucial importance to the users. The development of information technology has revolutionised the process of information retrieval.

Compact-Disk Read-Only Memory

Among the information technology applications for library management system CD-ROM databases are cost-effective. CD-ROM's were first used in academic libraries in the early 1980's. They had simple interface and were primary text-based and loaded on stand-alone systems. Now, due to advancement in electronic sector more and more users are using CD-ROM for retrieving information as it follows Hypertext system.

Unlike paper texts where information is generally expected to be read in a sequential manner, hypertext allows readers to navigate their own paths through the information. Thus, the author provides links between the related pieces of information in a manner to choose which links they wish to explore. Using a computer based hypertext system, students and researchers can quickly follow trails of footnotes and related materials without losing their original context. Since, the information in hypertext is both extensive and highly interlinked the hypertext system can be regarded as a means of browsing through a database of information. The number of CD-ROM based end user titles have also grown exponentially in the recent past.

CD-ROM is a high-capacity optical storage device of 12cm diameter which can store upto 650 MB of information; 2,40,000 pages of text or 70 minutes of music or video ; on a single 16gm platter of polycarbonate. CD's are unique because large volumes of data can be stored at a very low price.

Currently, CD-ROM contains more complex data storage which can be accessed very easily. Juke boxes with a capacity upto 500 CD's can be installed very easily in any library. The most recent development of CD-ROM as a delivery mechanism is CD-ROM networking or a CD-ROM server where with the help of a modem enormous data can be accessed with appropriate software and users can retrieve/download information online or onto local magnetic storage media.

Information Storage and Retrieval in CD-ROM

Storage and retrieval in CD-ROM's is possible by converting the information into series of 0's and 1's, these digits are stored on an aluminum surface as pits and lands respectively. These pits and lands are arranged on the disc. To read a CD-ROM, a laser light is thrown on the disc surface and the light reflection gives the data. In case of audio CD's the audio player simply traverses the grooves, thus decoding the information and sending this digitized information to digital-to-analogue converter. In case of PC's the CD-ROM drive passes the data to the PC, which takes over the task of conversion. The information contained in CD-ROM are as follows :

1. *Text* : Text plays a very important role and is considered as one of the most widely used CD-ROM component. In CD-ROM text can be presented in different forms like full text, abstract form, bibliographic format, etc.

2. *Still images* : Still images are nothing but graphic images like photographs, drawings, graphs, etc. In a CD-ROM these can be used for a better understanding of the text.
3. *Audio* : Audio is a major component of CD-ROM and is particularly important for presentations. By adding a sound card to the PC and using a waveform audio digitizer board and a microphone one can record voice or play a recorded information and link to a slide.
4. *Digital video* : It is possible to link direct feeds but it faces a problem as it requires massive disk space and a fast processor. Here a CD-ROM which contains enormous disk space can be made to contain video clippings which can be viewed on a PC.
5. *Animation* : Animation refers to moving picture or video and is widely used to prepare presentations. Many CD-ROM information sites use animation to enhance the text material for easy understanding.

CD-ROM's are used to store encyclopedias, dictionaries, studio quality audio/video, etc. and are largely used as a distribution mechanism for large software packages.

Advantages

1. CD-ROM contents can be read 10 times faster as compared to any diskette.
2. CD-ROM find a place in the information society not because of their storage capacity but also because of their durability, portability, low price and long life.
3. The toughness of CD's makes them more resistant to damage as compared with any other storage media.
4. CD-ROM cannot be infected by viruses. It is also unaffected by dust, fingerprints, scratches or magnetic fields.
5. It does not wear out easily as only the laser beam touches the disc, to retrieve the data.
6. It is immune from head crashes and data loss which is caused by adverse environmental factors.
7. CD drives offers high security as the data is safe and secure even if the laser-read mechanism fails. CD-ROM's are read-only so, one cannot accidentally erase or overwrite the data on it. Recording is possible only by using special methods.

There are multimedia informative CD-ROM's on wild life, on cities, on music, CD-ROM's to teach the alphabet, words, language, games, sports, CD-ROM's telling interactive fairy tales, etc. Encarta, a CD-ROM based Encyclopedia which takes particular advantage of the computer's dual abilities to search and to interact with the user.

Status of CD-ROM Server at SAC Library

In near future, SAC Library plans to establish CD-ROM networking. Presently, it has acquired a PENTIUM processor having 8 X CD-ROM drive, a sound blaster card and 14.4 Kbps modem. We have a collection of about 40 CD's on various Scientific and Technical subjects. Users can access these CD's from within the library. But library plans to acquire a CD-Server so that users can access from remote locations through dial-up modems. Also, library plans to get most of the journals on CD so that multiple users can access the journals online.

Conclusion

CD-ROM has been developed as a medium for the storage and distribution of large volumes of computerised information. CD-ROM's have an indispensable role to play in the dissemination of electronic information and are finding a special place in the rapidly growing digital libraries. Libraries can use the CD-ROM for storage of a large set of information or retrieval of the stored information. Many databases like abstracting and indexing services are now available on CD-ROM. The database on CD-ROM offers more freedom to the user in formulating search strategies. CD-ROM Networking can enable many users to access CD's. Started as a storage medium for high-fidelity music CD's have now invaded the multimedia world.

Acknowledgement

The authors are thankful to Dr. George Joseph, Director, SAC and Dr. S.B. Sharma, Chairman, Library Committee, SAC for their constant encouragement and kind approval to present this paper.