CHAPTER-3
DIGITAL RESOURCES IN AGRICULTURE UNIVERSITY LIBRARIES

Digital resources are now recognized as being of great importance for agricultural university libraries. The resources of university libraries which are available in electronic form or digital form are called digital resources and re-resources are defined as those electronic information resources and services that users can access electronically via a computer network from inside university libraries.

3.1 E-resources

An E-resource means a source applicable electronically for access information through the University website on or off campus. You can get the information you want, when you need it for 24 hours a day, seven days a week.

E-resources include electronic journals, online databases and electronic books. There are many thousands of articles and books available, and the numbers keep growing as new resources are added to collections in every minute. Using e-resources will guarantee of using quality information for your assignments.

(i) E-Journals A-Z

The E-Journals A-Z list allows you to browse alphabetic lists of the journals titles available online. The library has so many more journals available in print which can be found by searching the Library Catalog.

(ii) E-Books: Access thousands of online books through our subscription databases. The "How do I find E-Books" page provides links to the library’s
major E-Book databases and historical collections to Google Book Search, and to other E-Book collections. The majorities of these books are cataloged and can be accessed via the Library Catalog.

(i) Database Finder E-Resources (A-Z)

The library subscribes to many different types of electronic resources from those that provide indexes of journals articles to those that aggregate full-text content from a variety of different publishers. The Database Finder provides alphabetic and subject-based lists of these electronic resources, including descriptive and coverage information to help you select the most relevant resources.

(iv) Cross-Search: Search the contents of several databases and e-journals at once.

(v) Quick Search: Search the contents of pre-defined sets of databases at once.

(vi) Electronic Text Services: Electronic full texts of scholarly monographic reference and primary source materials.

(vii) Current Database Trials: Use and evaluate databases available on a trial basis at the University of Chicago Library Suggestions and comments are welcome.

(ix) Citation Finder: Enter the information you know about the article, journal, or book into the form below and the Citation Linker will help you to locate the full text- whether online, in the library, or through interlibrary loan.

(x) Ref Works: Ref works is a web-based bibliographic tool which lets you save and use citations. Automatically formatting them in a variety of different citation styles for use in bibliographic and footnotes. The Library
subscribes to Refworks and makes accounts freely available to all University faculty, students, and staff.

3.2 Information Resources Sharing

Digital material and digital service combination makes a digital library where Digital materials are stored, processed and transferred via digital (binary) devices and networks. Both digital and electronic libraries can be shaped as virtual libraries if they exist only virtually. A virtual library consists of material from a computers and computer networks.

“Digital libraries provide the resources, specialized staff to select, structure, offer intellectual access to, interpret, distribute, preserve the integrity of, and ensure the persistence over time of collections of digital works so that they are readily and economically available for use by a community.”

A digital library may be organized by(indexed, classified, and cataloged) human specialists or it may be entirely unorganized, using free text searching for providing some or all access to the objects in the library. A digital library is different from general library as it consists of services of internet, multimedia, computer etc. and provide all information in an digitized form to all as desired by UNESCO information Manifesto. Almost all the countries rich or poor, advanced or developing are moving very fast in this direction.

Library Digital System focuses on acquisition cataloguing including online public access catalogues, circulation control, management information, inter-library loans, etc. In the beginning, computers were considered not efficient enough to provide the services. Now, the online public access catalogues have improved their search facilities to include many of the features originally encountered only in information achieved through
bibliographic databases. Information retrieval applications have provided access to information embedded in electronic journals and other documents.

Information retrieval applications include online search services, the internet and the CD-ROM, current awareness services and printed indexes for the purpose of information retrieval systems. Documents management system may store the documents in electronic form and provide appropriate retrieval mechanisms so that specific documents or sets of documents can be retrieved. The documents may be held in microfiche or print form, and only the index is in electronic form. The Internet, a worldwide network of telecommunication networks, provides access to a number of computers or servers. Search engines support retrieval in this undefined and enormous bank of information. Some of the computers or servers are those of the online search services which provide access to selected and evaluated databases. Database can be acquired on CD-ROM. Organizations and specifically libraries may then choose to network these CD-ROMs. The CD-ROM is supplied with a search or information retrieval software so that it is possible to locate specific information within the database.

3.2.1 Internet

The internet is the ultimate open transmission system. It is well established and widely recognized. It is a platform where many systems can communicate with each other. Moreover, it is a cheap communication channel for the society and a media of communication.

3.2.2 Information Producers

It is an important channel of electronic publication. The competitiveness and effectiveness of individuals, organizations and societies are increasingly dependent on their information-processing and knowledge-creation
capabilities. Information managers need to be able to create systems that evolve effectively in a rapidly changing environment.

3.2.3 Market Places

Sociological, technological and political forces are important in the information environment. These factors transcend national and international boundaries.

3.2.4 Information Society

Information systems have changed the society where all communication is electronic and processes all working, tele-learning and teleconferencing or even videoconferencing substitute the actual person-to-person contact, must have significant implications for the way in which human beings satisfy their need for interaction with one another. Currently information and information systems and the associated communication are gradually increasing their impact on our society.

3.2.5 Copyright Issues

Quality information with factors, i.e. text, statistics or multimedia, costs time, efforts and money may be created. Yes, it is difficult to enforce appropriate copyright protection with electronic documents. In digital documents, copyright and up keeping of originality are two important aspects which need to be looked into. Audio-video can be seen but the material of Internet is at present being used by admitting the researchers in the footnotes when accessed with time.

3.2.6 Data Protection and Security
Some data are kept secure which includes financial transactions, national security and commercially sensitive data; we may all rightly be sensitive about the data about us that is stored in a variety of different databases. Also, for the safety of the individual, protection of personal data is essential.

### 3.2.7 Bibliographic Control

The digital library in all of its manifestations (e-publishing, e-printing, digitization etc.) will provide content for next generation e-learning environment. E-learning will decrease the digital divide of the country. Similarly, some states have made provision for computer education from school level whereas some states are unable to provide such facility to all the schools.

### 3.2.8 E-learning

E-learning framework might be more advantageous to people and educators and for quality training. It will make a learning asset for the country and any module could be effortlessly imparted by anybody, anyplace. E-learning intends to give astounding learning backing to the learners, which is tantamount to up close and personal instructing. Such a successful learning, enhanced quality, decreased length of time, expense viability and adaptability might be recognized as goals of E-learning. The mode is not sincerely, 'online instruction' yet may be called as a 'web empowered training'. In India, at first the costs were high, yet with the progression of time the costs of workstations and extra parts and in addition scanning pursues have radically come. It has empowered the poor and creating nations to profit the office of getting training 'anyplace at whatever time'. E-learning is an extraordinary venture forward guaranteeing quality training for all, with expense adequacy at entryway steps of learners.
3.2.9 Web Services

The next phase of this revolution is the development to true Web services. A web application offers a service that requires the intervention of the user, while a web service facilitates direct program-to-program interaction without user intervention. Web services are functional components that can combine with other services dynamically to create more useful or powerful application. Unlike the printing press or the medieval codex, the computer does not require any aspect of writing determined in advance for the whole life to the text. This restlessness is inherent in a technology that records information by collecting for fractions of second evanescent electronics in tiny junctions of silicon and metal. All information, all data, in the computer world is a kind of controlled movements, and so the natural inclination of computer writing is to change, to grow and finally to disappear.

3.3 I.T. Application

A great responsibility rests on the shoulder of the librarians in making India a knowledge resource through ICT applications in processing of information, organizing of information and serving the information to be user‟s community of today. Libraries have got to be upgraded in terms of documentary resources and ICT information with built in provision of training and retraining of library and information professional to equip them fully to gain competencies in the use of different databases and appropriate search engines. Quality of library service is sure to change in e-enabled and ICT support environment.

There is a saying in library profession that “Best reading for the largest number of the least cost” is a great challenge before librarian‟s community particularly in universities who are facing many problems. There is a need of
sufficient fund which ensures thinking of subscribing to online database and subscribing consortia to meet the user’s demand. Many publishers have started e-publishing and e-version besides paper print format which has resulted to easy access to latest information, saving time and space, unlimited concurrent use, downloading saving, reading, forwarding facility at the click of the button. It is more interactive in comparison with other media, no problem of theft, pilferage, and mutilation in e-resources and no fear of misplacement and hiding the resources.

**NISCAIR (2002)** perceived the need of consortium of CSIR in 1993 in Bangalore and started functioning in 2001 with the object to provide CSIR S & T staff electronic access to world S & T literature. It entered into agreement on June 2002 with Elsevier and initiated e-journals consortium to access 4500 journals. Moreover, with the emergence and advancement in World Wide Web and IT infrastructure, publishers are able to offer their journals online. DST jointed CSIR consortium. Therefore in late 2011 both developed consortium “National Knowledge Resources Consortium” enabling online access to 32 knowledge consortiums serving the user’s i.e. N-List program of INFLIBNET Centre (2137 Full-Text Journals, 4814 e-books), INDEST-AICTE Consortium.

Thus the membership of a consortium will change the face to libraries and enhance the user’s satisfaction level. Society has to change its view and take it granted that libraries are information centres and advances in ICT are bring the libraries to support the teaching and research, curriculum sustainable reading habits.

3.3.1 Information Resources
3.3.1.1 OPAC
The OPAC (Online Public Access Catalogue) have recently proliferated worldwide. Over the period of a decade OPAC's have developed into a rather crude finding list, often with only one or two access points into a sophisticated retrieval system, perhaps providing a mix of techniques, including multiple access points. Most of the libraries today are involved in the installation, introduction, training and use of OPAC. In India, it is slowly emerging in the major R&D and special libraries.

Since the introduction of OPAC in the early 1980s numerous „users survey’ and „use studies” have been conducted. There are important survey which has been the federated studies conducted under the aegis of the Council on Library Resources (CLR), transaction log analysis, and focus group interviews to determine patterns of catalog use. Substantial research work is being carried on both concerning the implementation of OPAC and in assessing their impact on libraries and their users.

Hence the measurement parameters such as recall and precision may be used to examine the OPAC; however, it should be measured under the larger umbrella of information seeking behavior, which as to include psychological motivation of end users who use the catalog e.g. Students, faculty, staff, uses the catalogues. They exhibit different needs, pattern of use and levels of skills? Should the catalog be aimed at a specific user group or varied users.

What is the best way of mediating between the computers and its users? How can language and the sequence of logic steps of software design increase the ease and efficiency of consulting catalog. It needs proper machine configuration and a level of computers resources and changeable database design with the technological developments.
What machine configuration will best support an OPAC, what level of computer resource will be required? The database design should be easily changeable in accordance with the technological development.

3.3.1.2 CD-ROM

CD-ROMs are unlike „hard disks“ very light, small in size, and easy to transport. Presently most of the CD-ROMs in large size textual databases are available such as reference books, trade directories, catalogues, bibliographies, indexing and abstracting periodicals, full text journals, bibliographical databases etc. Moreover, the present version CD-ROMs have integrated the text with graphics, sound and pictures; and hence they become more interactive information systems. Patrons may access CD-ROM resources through networks in an organization. This has resulted CD-ROM networking would be much more effective than individually working. This way CD-ROMs networking share information resources with the users. CD-ROM networking offers an opportunity to make vast amounts of data/information available simultaneously and provides greater speed and independence. Information computer technology is developing and becoming more popular among users to decide the required information and how it accessed effectively task. CD-ROM was introduced in 1985. It is the one of the derivatives of compact audio disk. The disk is normally made out of polycarbonate, in between two layers there will be a metallic film on which the actual data will be recorded in a „pitted language“. For the present, all the CD-ROMs are single side recorded disks and the efforts for both sides recording are still going on. Reading is done by a non-contact method which is free of wear. CD-ROM has become one of the best, powerful tools storing and retrieving of huge amount of information in libraries and information centers. CD-ROM is an inexpensive medium but this could distribute a large very easily.
3.3.1.3 Features of CD-ROM

(a) It has a high storage capacity.
(b) It has easiest and random access of information.
(c) It has very low publishing cost.
(d) It is easy to distribute.
(e) It has high data integrity.
(f) It has more durability.
(g) It has high archival life.
(h) It is more reliable.
(i) It has effective standardization.
(j) It is more resistance to damage.
(k) It is easy to use.
(l) It serves high cost building and shelf storage space.
(m) User themselves can do their information searches, which gives more satisfaction.

3.3.1.4 Disadvantages

(a) It is read only memory therefore one cannot write, store or alter the data after mastering the data.
(b) A CD-ROM workstation could run only one application at a time.
(c) Its equipment and production is too expensive.
(d) Any careless use of disks causes, not only damage to disks, but also incorrect reading of data.
(e) It is user-friendly but a minimum basic training or knowledge is required to use, and
(f) It has lack of market stability.
It is suitable to libraries because of saving of building cost, stack storage space. Users can access themselves without other help. Moreover it gives satisfaction and better than hard copy.

### 3.3.1.5 Applications of CD-ROMs

CD-ROM is a database which provides instantaneous reference service to their users. All the prominent libraries had already started using them effectively in developing countries in providing various types of services to their users.

- **(a) Peer-to-Peer CD-ROM Drives Networking**

  In peer-to-peer networking CD-ROM drives are connected to one of the computers on the network. After connecting, the CD-ROM drive will be given a letter (e.g. E: or F:) through which other computers can be used to scan all the attached drives. Once this has been done, the user can access the CD-ROM drive, as if that drive is directly connected to their computer.

  Peer-to-peer networking CD-ROM Drives are Inexpensive and easy to install the drives, and One CD-ROM drive will serve requirements of several users. But it is also not suitable because of access to the CD-ROM is slower, and 10 users is the maximum limit to get satisfactory results in this network.

- **(b) Client-Server networking**

  The CD-ROM drive can be attached to the network in two ways: (i) to the file server, and (ii) dedicated CD-ROM server. First approach is simple as the drive is attached to the server with a SCSI host adapter. Second way is to create a totally dedicated CD-ROM server with attached CD-ROM drive(s). for example, there are few client servers like OPTI-NE, Meridian Dates CD-Net, CBIS CD connection etc.

  The advances of client-server networking CD-ROM drives are:

  - It allows the users to connect to CD-ROM at the same time;
- It allows to combine CD-ROM „Juke Box“ servers;
- Its file server is dedicated to the function of sharing data;
- Its individual system need to have the CD-ROM device drivers to access the CD-ROM;
- It is expensive, sometimes not justifiable, if resources are limited.

3.4 Operating System-based Networking

There are operating systems (OS) including DOS, Windows and LAN OS which are not used with CD-ROM drives. But there are few companies like Microsoft which have written an extension of DOS to command and to enable CD-ROM unit to be arrested as another hard disc. Microsoft also introduced Windows NT (New Technology) to read CD-ROMs directly if they are attached to the computer via a drive. After the introduction of Novell"s Netware 4.0, the Netware users were able to access CD-ROM drives. Now the new Netware has got Netware Loadable Modules (NLMs) which allows a CD-ROM drive to work successfully.

Operating system is useful because it is a:

(a) Very fast and better performance over the peer-to-peer method;
(b) Does not require any additional software, other than networking software;
(c) Most effective way of attaching CD-ROM to a network.

But due to extra burden of on the file server, the time spent on core function, may be reduced.

3.4.1 CD-ROM Networking Systems

CD-ROM networking has five systems: (i) CD Net, (ii) LAN tastie, (iii) OPTI-Net, (iv) Multi-Platter, and (v) Novell Netware.
3.4.2 CD Net System

It is Meridian Data Inc. USA which introduced the first CD-ROM networking systems for standard Local Area Networks (LANs). CD Net is primarily developed for a small to medium sized LANs which will provide a lot of facilities such as duplicate disk capabilities, making use of CD-ROMs on a network, as fast as, or even faster than, if they have their own CD-ROM disk drive. This system can be configured for Token Ring, Ethernet, Novell Netware, NetBIOS LANs, and WANs. Each CE Net accommodates up to 28 CD-ROM drives (16 gigabytes) per system and there is no limit of CD Net units to be placed on a single network.

3.4.3 LAN System

The second system is LAN System. It is cheaper, easy-to-install and use CD-ROM LAN system. It hardly took 20 minutes for installation. It is an ideal network solution for a small library and CD-ROM network. It is advantageous because of ability to share Microsoft MS-DOS Extensions. However, only on „the server” the extension will work and allows a maximum of 120 users.

3.4.4 OPTI-Net System

The third system is OPTI-Net System. It was introduced by online Computer Systems Inc. OPTI-Net is another CD-ROM LAN System which provides software and hardware options. It gives high performance access to CD-ROM database over any NetBIOS compatible network. OPTI-Net can be configured for Novell"s IPX/SPX and NFS (Network File System) users. This system comes as a package which includes a four drive CD-ROM Jukebox
unit, the OPTI-Net drive sharing software, adaptor card and cable. This system was rated by server reviewers of the magazines.

### 3.4.5 EZ-NET

The fourth system is EZ-Net, which is a total CD-ROM Network solution. EZ-Net is a turnkey CD-ROM Network that can be installed and operated by the average person. It can be straight away plugged in and install the CDs. The access time to any CD files ranges from 6-15 seconds. EZ-Net software provides fast access to CDs library, simultaneously by multiple users. Its operating system support DOS, OS/2, Windows NT, Novell Netware, SCO UNIX 1, Power LAN, SunSoft Solaris, UNIX DEC Path works, Banyan, IBM LAN server. It is an inexpensive system.

### 3.4.6 Multi-Platter System

The fifth system is Multi-Platter system. It is a multi-user system called „Multi-Platter” which can allow maximum 20 terminals within a distance of 600 feet distance from the workstation. It has got the facility of searching the same disk simultaneously by different users and also eliminates the waiting time in a LAN. Presently, it is having a dial-in capability for remote users and a bridging module which links Multi-Platter to a campus wide or other general network.

(a) Since it is a modular system. One can add more drive towers to increase the storage capacity according to their requirement.

(b) It provides statistics package, to help the management for monitoring which CD-ROM and workstation is used how long etc. Usage statistical reports can be made daily, weekly, monthly or any block of time, for finding out the usage of CD-ROMs and workstation also.

(c) One can save lot of budget, because one disk is shared by so many users.
(d) More user satisfaction.

3.4.7 Novell Netware Systems

The next system is Novell Netware System, which was introduced by Phillips Interactive Media Systems. By adding a Networking Interface Card (NIC) and driver software to the working station, all the work-stations in the network will function as dedicated CD-ROM system. The server software not only requests but also identifies the drive to be accessed and retrieves the information and passes back. A server can support a maximum of 100 concurrent users and eight CD-ROM drives. The data/information can be stored on the server’s hard disk. By using with Ethernet, this system will accept the users within a distance of 2.5 kms. It also allows access by telephone/modem link within a distance of few hundred kms. from the server.

3.5 Storing and Retrieving

CD-ROM system allows the user to manipulate a vast amount of data according to his needs. Nowadays a few CD-ROM systems could be networked and shared by several users in the network, with the result the cost of information searches have gone down. The users in that network are able to keep vast amount of information at their fingertips which is very much cost-effective to any organization. By connecting all the optical disk systems together, the retrieving time can also be reduced enormously. Moreover all the disks may not be used by the users all the time in that network. The number of disks and disk drives depend upon the requirement of the user, loading and unloading of disks will be done by a picker (robot) automatically within a few seconds. Normally all the optical disk libraries will have four basic units: First is Storage Matrix; in which all the optical disks will be stacked in rows either horizontally or vertically, the number of stacks and the disks in a
stack, will depend upon the size of the library which is a variable. Secondly Disk Drives Domain; in which the entire disk drives will be fitted at one place. Thirdly Robotic Picker, which will be used to pick up the disk according to the computer instructions, through the controller, from the stack and puts into the drive; after searching is over; automatically it will put the disk back in the stack from where it was picked. Fourthly, the Controller; the main unit which will accept the commands from the computer and user, and gets the searching done in library. It is the central controlling unit which will be controlling rest of the three units in the library.

3.6 Networks in India

INDONET was computer network commissioned in 1986 by CMC Ltd. In the first phase, mainly they have networked Bombay, Calcutta and Madras; after some time New Delhi and Hyderabad were also linked as additional stations. INDONET is presently having an International gateway which is providing access to worldwide packet switched networks like USA”s Global Network Systems (GNS), TELNET and INTERNET, Singapore”s TELEPAC and Germany”s DATEX-P. With the present network one can access the information from the world major databases such as NTIS, INSPEC, ERIC, COMPENDEX, MEDLINE and CLAMS. It is costly affair but CD-ROM LAN System has solved this problem. Several organizations have joined networks such as BTISNET, CALIBNET, SIRNET, DESINET, ERNET, INFLIBNET, VIDYANET etc. It is better to develop the CD-ROM collections in their own fields first, afterwards install a CD-ROM LAN system, so that all the users of these networks will access other”s database. This encourages sharing others resources, and saves lot of budget of many participating libraries. CD-ROM
networks not only save money, but also have influence on education; research and industrial output which is required in India right now.

References:
