2.1 Introduction

The objectives and functions of engineering college libraries demand the acquisition of information in different formats along with time. It is known fact that information is being published in electronic form besides print version. As stated earlier, the growth of electronic resources and their use in engineering college libraries is increasing and also the electronic resources are available economically and their compatibility to available infrastructure in libraries. Beside these factors, the electronic information can be accessed at anytime and anywhere, this made the professionals in engineering colleges thought of selecting and acquiring E-Resources in their libraries, so as to satisfy the information requirements of users. Therefore, there is a need to understand the growth and development of electronic resources in order to develop the collections systematically.

2.2 Electronic Resources in Engineering College Libraries

The information explosion that has revolutionized the globe in the last four decades. But the advent of Information and Communication Technologies, the Internet and particularly the World Wide Web has changed dramatically everything on the earth. The Libraries and Information enters have gained a lot with the help of Information and Communication Technology. A job that used to take hours together earlier is now just a mouse click away. The publishers did not remain behind; they took advantage of these applications to a considerable extent and tapped a treasure house of electronic and web resources. This has
created a thought on actual possession of resources to actual access of the same, thus creating a change in the collection development in an electronic environment. The engineering college libraries acquire electronic resources to support the various activities of the students & staff and their research.

The information scenario is changing at a faster rate. The reasons for this change are many. Library users increasingly demand resources in Electronic format, because of its associated advantages (such as their simultaneous presence, faster search ability, easy manipulability and accessibility). More and more library staff are now at ease with ICT and ready to explore the functionalities of the software/hardware to the maximum extent, starting from the lower level. Librarians are also becoming active and creating alliances with the academics to design environments to integrate ICT into the new teaching and learning methods. The library and computing services are going hand-in-hand to support users. The remote users who want to access E-resources from their home, work place and while on move is on rise. Libraries and other places of higher learning are slowly developing institutional repositories where the information generated by its members is archived, using appropriate software and made freely available worldwide, as far as possible. Publishers, vendors and agents are aware in the developing market for electronic resources and are eager to supply electronic resources/services along with print based materials. Further, the World Wide Web (www) is an important versatile platform for the delivery of needed information and provides a basis for the shift from ownership of physical collections to access on demand. Web being a real time information
delivery channel, has made CD-ROM based delivery a reality. The shift is not only taking place within the knowledge centre but throughout the various facets of academics in an engineering college library. This is because of the changes in syllabus structure, distance education provision and delivery of teaching through virtual classrooms, using the internet platform. However, current Library Management Systems (LMS) adopted by our engineering college knowledge centers are not very helpful in the management of electronic collections as they were primarily designed for print based resources and lack of the capability to manage the vastly changing electronic resources. Dedicated Electronic Resources Access & Management Systems are now making their appearance in the market and some old LMS are also adding Electronic Resources Management modules to their systems for upgradation. These new generation systems will also help in the shift from printed to electronic resources. Hence to meet the demands of users, libraries are shifting towards new media - namely electronic resources for their collection development. As the managements of engineering colleges are ready to spend huge amount of money on electronic resources, it seems justified that the library managers have to examine the process for selecting such resources. Collection development policies and ordering processes for print collections have found a place in many, if not all, engineering college libraries. As the transfer from paper to electronic resources occurs, especially in the acquisition of serial titles, it is necessary to examine the various processes in engineering colleges libraries in particular and other academic libraries in general to select various electronic resources.
The following types of electronic resources are mostly using in engineering college libraries:

E-Databases,
E-Journals,
E-Magazines,
E-Books,
Wiki Books,
E-News,
OPAC (Online Public Access Catalogue),
E-Images,
E-Subject Guides,
E-Conference Proceedings,
CD-ROM's

2.2.1 E-Databases

E-Databases (Electronic Databases) include periodical indexes & abstracts for example Library and Information Science Abstract (LISA), METADOX (Metal Abstracts), SCOPUS (Abstracting, Indexing and Citation data in Science, Engineering and Technology), WIPS (Worldwide Intellectual Property Search), ASTM standards, ASTM Journals, Life Science Review Journals, Communication & Mass Media, Magillion Literature Plus, Taylor & Francis (List), Directories, Encyclopedias, Dictionaries and related reference works.

2.2.2 Electronic Journals (E-Journals)

E-Journals are a vital source of information for academic, research and development. The advantages of the electronic journals are easy, ‘anywhere–anytime’ accessibility, sharability, hyperlink facility to related texts, cost-
effectiveness and obviation of the storage problem encountered in the case of print journals. Many Open Source E-Journals are available through Internet also.

2.2.3 Electronic Magazines (E-Magazines)

Magazines can now be in zinio format instead of the hard copy for a price, which is equivalent of the print version.

2.2.4 Electronic Books (E-Books)

The term ‘e-book’ includes the hardware, a suitable device to read electronic media, perhaps better called ‘e-book reader’. The hardware is important as it provides what readers may need to exploit with the software available and link this to specific requirements. E-Books could be viewed and listened to, synchronously and asynchronously after storage and retrieved from anywhere.

2.2.5 Wiki-Book

Wiki book is a type of e-book. The writing of such an e-book could be done individually or shared easily with other authors and with restrictions on who could make changes, unlike Wikipedia as normally seen. More complex material could be added as a box in the text – although it may be used to show examples or explanations of related material. For example, in plant morphology book, there could be a box about photosynthesis. However, some students might want an explanation or refresher about electronic transfer. This could be provided within that ‘wiki-book’ or even to a quite different wiki-book if that were available. The whole structure could be formulated with such additions included as required. Even on a small e-book reader, readability might be enhanced. But textbooks
are not usually written in this way. Hypertext provides an entirely suitable way of providing this material.

2.2.6 Electronic News (E-News)

E-News can be accessed resources like LexisNexis and Factiva, and links to local, national and international newspapers.

2.2.7 Online Public Access Catalogue (OPAC)

The OPAC is a database describing documents via bibliographic entries composed of fields, some which may be queried. It provides access to bibliographic records for the entire collection of books, back volumes, video and film of the library. The OPAC can be searched in many ways as detailed below.

- Accession number search
- Author search
- Title search
- Title keyword search
- Author/Title search
- Serial number search.
- Subject search

2.2.8 E-Images

Digital images are electronic representations of images that are stored on a computer. The most important thing to understand about digital images is that you can't see them and they don't have any physical size until they are displayed on a screen or printed on paper. Until that point, they are just a collection of numbers on the computer’s hard drive that describe the individual elements of a picture and how they are arranged. These elements are called pixels (short for
picture elements), and they are arranged in a grid format with each pixel containing information about its colour or intensity.

2.2.9 E-Subject Guides

The subject librarians maintain online subject guides that direct you to the best resources in your research area including databases, books, and journals. For example, if you have a business question, the business subject guide will provide database recommendations and ways to get started on business topics.

2.2.10 E-Conference Proceedings

A collection of academic papers presented at a professional association meeting or conference. However, many of the words, like *meeting* and *conference*, which make up that definition are interchangeable with other terms...and often are. If you're not an academic or an engineer, you will benefit from the following expanded explanation.

2.2.11 CD-ROM

CD-ROM (Compact Disc, read-only-memory) is an adaptation of the CD that is designed to store computer data in the form of text and graphics, as well as hi-fi stereo sound. The original data format standard was defined by Philips and Sony in the 1983 Yellow Book.

2.3 Selection of Electronic Resources

Selection of electronic resources is the core collection development function and the primary objective of the selection decision for any format is
fundamentally the same as college library objectives like satisfying the user needs. With the advent of e-resources, job responsibilities of selectors have changed drastically. In the past, selectors recommended new titles on an individual basis using traditional selection criteria such as quality, relevance, use and cost. Selectors analyzed faculty and user requests for new titles and made requests to add to the collection. But in the cyber world, the roles of selectors have changed remarkably as E-Resources have expanded and developed. Selectors must now address new issues as part of the selection and management processes, issues such as easy and quick accessibility for users, continuous content, evaluation and technological and legal concerns.

Electronic resources are revolutionizing engineering college libraries. Many librarians believe that these resources have changed the principles of selection radically, some believe that they will virtually eliminate selection. Although it is true that the art of selection is undergoing profound change, the selection of materials is still crucial for libraries. The basic criteria for selection of E-Resources are quality, relevancy, aesthetic and technical aspects and cost.

2.3.1 Selection Tools

- Publisher Catalogues through vendors.
- Reviews in Electronic periodicals or Journals.
- Vendor websites like GIST.
- Observation of other college library resources.
- Publishers' demos in seminars/ Conferences.
- Opinion from experts/ Faculty.
- Enquiry with existing vendors.
- Trail offered by publishers.
• Trail offered by vendors and
• Consortiums.

2.3.2 Selection Issues

The following are the important issues should be taken into consideration while selecting an e-resource:

2.3.2.1 Technical Feasibility

It includes, but not limited to:

a) Availability, e.g., remote access, stand-alone access.

b) Authentication, e.g., IP [Internet Protocol] filtering or login password.

c) Hardware and software compatibility and capability.

d) Storage and maintenance, e.g., remote hosting v. local hosting.

e) Platforms which facilitate access to e-resources.

2.3.2.2 Functionality and Reliability

It includes but not limited to:

a) Search and retrieval functionality, e.g., truncation, browsing, search history, transliteration.

b) Exporting and downloading, e.g., printing, e-mail, downloading to a machine, and downloading to an electronic device.

c) Sorting and ranking abilities for database results. For example: author, title, date, relevancy, facets, etc.

d) Interface, e.g., system intuitiveness, navigation, help and tutorials.

e) Integration.

f) Reliability and availability, e.g., response times, 24/7 access.

2.3.2.3 Vendor Support

It includes but not limited to:
a) User training and support.
b) Trials and product demonstrations.
c) Technical support and system notification process.
d) Statistical reporting.
e) Customization, e.g., branding.
f) Provision of bibliographic data, e.g., MARC records.
g) Data security and archiving policies.

2.3.2.4 Supply

It includes but not limited to:

a) Purchase model, e.g., purchase, subscribe, pay per view, rental.
b) Pricing models, e.g., selective v. big deal.
c) Access options, i.e. single user, multiple users.
d) Archiving and post termination rights.
e) Maintenance fees.
f) Cancellation rights.

2.3.2.5 Licensing

It includes but not limited to:

a) Model/Standard license.
b) Governing laws.
c) Liability for unauthorized use.
d) Definition of authorized users.
e) Definition of authorized sites.
f) Fair use provision.
g) Termination.
h) Refunds.
i) Period of agreement.
j) Compliance with the governing laws of the library’s or consortium’s legal jurisdiction (province, state, country).
2.3.2.6 Currency

Resources should not lag behind with their print counterparts.

2.3.2.7 Value for Money

The electronic resource should provide sufficient added value over the print equivalent of other formats (e.g., increased functionality, increased accessibility).

2.3.2.8 Accuracy and Completeness

The electronic resource should reflect the same or increased content as compared with the print equivalent.

2.3.2.9 Duplication

Duplication may be considered if the electronic publication is not archived and retention is expected. If the cost of duplication is minimal and multiple formats be acquired.

2.3.3 Collection Development Policy

Due to proliferation of electronic information resources, library activities like provision of E-resources, organization, digital based services and user education have undergone drastic changes. The emergence of E-Resources have brought with them ‘access model’ in place of ‘ownership model’ for information resources. The E-Resources are available in different forms and formats both for procurement and for free of cost. The E-Resources have posed new challenges for the librarians, particularly in collection development.

Collection development was understood to cover several activities including the determination and co-ordination of selection policy, assessment of
the need of users, collection analysis, selection, budget management and planning for resource sharing. Collection development has been influenced by the spread of digital technology as a means of information creation, communication, access and dissemination. The collection development of E-Resources have seen several trends, namely macro level selection instead of micro level selection; trail access instead complimentary copies; co-existence of print and E-Resources; co-ordinate and collaborative collection development and outsourcing of collection development.

There are several challenges in collection development of E-Resources such as complicated procurement and preservation system, technological obsolescence, non-compatibility of organizational culture, security in library environment, resistance to change, etc., in addition to licensing, copy right issues and provision of access to E-Resources.

Collection development policy is essential to develop a need based, balanced and up-to-date collection of print and digital resources. Without a collection development policy there will be a great confusion in collection building. The collection development policy describes the collection as it is now and as it will be. It is a systematic document, both comprehensive and detailed, that serves multiple purposes like planning, allocation, information administration and training.
2.4 Evaluation of Electronic Resources

Evaluation of electronic resources in libraries is an important and a crucial activity. Evaluation helps the selectors to determine the cost, the reliability of the content provider, and most importantly the authoritativeness of the resource. A selection tool such as a trial or demonstration of the product by the provider, as well as reviews in print and electronic sources, helps in evaluating the product and leads to sound decisions. For print resources, the selectors consider the credentials of the author, currency, intended audience, accuracy, ease of use, reputation of the publisher, the subject, cost and the curriculum or research needs of students/faculty/patrons. They also use methods such as citation analysis, user surveys, and so forth. However, with e-resources the selector must consider additional elements such as easy access to the content, coverage, search capability and functionality of the interface, quality of technical support, method of pricing, and provisions of licensing agreements. Thus, the typical evaluation process for e-resources has many facets, and following the various selection criteria is vital for selectors.

2.4.1 Content

For content evaluation, the selector reviews the content of the electronic format and compares it with the print counterpart, if available, to find out about coverage in full text, availability of retrospective material, authoritativeness to determine the accuracy of the content, and completeness of content such as access to graphs, tables, illustrations, and advertisements. Also, it is important to
check for duplication of the content in other e-resources, especially in the case of electronic journal packages.

2.4.2 Technical Requirements

Electronic resources also present a number of technical issues that need to be considered to ensure resources are compatible with existing library hardware and software and that the library has the capability to provide and effectively maintain access to resources on an ongoing and cost effective basis. Evaluation should be in consultation with the appropriate technical staff and should include consideration of the following:

2.4.2.1 Method of Access

There are many methods like stand-alone, remote via Web, local Web mount or hosting are available for access to e-resources. Access to remote hosts via Web is often preferable, because it provides additional benefits such as faster updating, optimum access, reduced burden in terms of storage, preservation and maintenance.

2.4.2.2 Authentication

In order to satisfy the contract terms with electronic resource vendors, libraries need to make sure that only authorized users i.e., faculty, staff, and students in an academic setting have access to these resources. To accomplish this, a form of access control is necessary. Access control is normally a two-step process: authentication and authorization. Authentication is the process of validating the identity of someone. It uses information provided by the authentication source to determine whether the user is really claims to be.
Authentication is normally performed by checking against identity credentials that are usually based on unique factors that only the user would know (e.g., student/employee ID number, barcode number, user name, password etc.)

Access via IP filtering is usually preferable because it typically provides simultaneous access for multiple users. IP-address recognition also provides access to users via a proxy server allowing authorized library users to access content from outside the physical confines of the library. In such circumstances a commercial database “sees” and recognizes the library IP address, not the user’s home or any other IP addresses, and grants this user access. It should however be noted that access via proxy server must be predetermined in the license agreement. Access via login and a password is less preferred as it presents a number of challenges around dissemination and control of passwords, particularly when a library serves a large user base. If a vendor insists on password-based access, a disclaimer in the license agreement must be made about the library’s inability to control distribution of this password to non-affiliates.

2.4.2.3 Compatibility

The resource should be compatible across a range of platforms and where local installation and maintenance are required, should be compatible with existing hardware and software available in the library. The selector should also determine, if the electronic resource requires any special hardware, software, multimedia or audio capabilities.
2.4.3 Functionality and Reliability

In assessing the suitability of a resource in terms of functionality and reliability issues, the library may find it useful to evaluate the following:

2.4.3.1 Interface

The electronic resource interface should be user-friendly, easy to navigate and intuitive. User-friendly resources often include such features as online tutorials, introductory screens, navigation aids and context-sensitive help and personalization options such as subscribing to feeds/e-mail alerts, save search history etc. The screen design should be easy to read and follow and consideration should be given to the similarity of the resource interface to others already in use and with which users are already familiar.

2.4.3.2 Search and Retrieval

The resource should offer a powerful, flexible and user-friendly search engine. Common features might include keyword and Boolean searching, full-text searching, truncation, browsing (index and title), relevancy ranking, thesaurus and search history. Consideration needs to be given to how the search engine works and how issues such as transliteration and diacritics are managed.

2.4.3.3 Exporting and Downloading

A range of export options such as e-mail, printing and downloading (to a machine or a Personal Digital Assistant) should be supported. Provision of citation downloads to citation management software (such as Endnote, Mendley, BibTex etc.) should be available. Consideration be given to the ease of printing or downloading and to any restrictions suitable fee be imposed.
2.4.3.4 Response, Reliability and Availability

The system should be available 24/7. It should be stable with limited evidence of unscheduled downtime. The system should be technologically up-to-date and have the appropriate capacity and network infrastructure to support multiple users and optimum response times.

2.4.3.5 Integration

The system should support integration with other resources via reference and full-text linking.

2.4.4 Vendor Support

Consideration needs to be given to how well established and reliable an electronic resource vendor is and to the range of technical and user support services they are able to provide. It is useful to determine the range of vendor support services available.

2.4.4.1 Trial Evaluation and Product Demonstration

It is preferable for the resource to be available for trial and for the vendor to provide, if required, product demonstrations. Trials are particularly useful in supporting the evaluation process of a product in terms of technical issues and functionality and reliability.

2.4.4.2 User Training and Support

The vendor should be willing to provide initial and ongoing training, including the provision of documentation or online manuals, in the use of the product. This will help to reduce the burden of training and development of
documentation that might otherwise, fall on library staff and ensure that products are used effectively.

2.4.4.3 Technical/Customer Support and System Notification Processes

The vendor should be willing to agree to service levels in terms of system availability and response times for resolution of technical issues. The vendor should also have an advance system notification process in place to effectively manage and communicate planned downtime and content and platform changes.

2.4.4.4 Customization

Consideration needs to be given to the options available from the vendor for customization and branding of the product. This is often helpful in giving products used within the library a similar look and feel.

2.4.4.5 Data security and archiving

Consideration should be given to how frequently system data is backed up and what will happen to the resource and library patrons’ ability to access it, if the provider declares bankruptcy or decides to liquidate. If backup data is offered in CD-ROM or DVD format, consideration needs to be given to the library’s capacity to manage archiving and access in this format and to the features that might be lost compared to the original resource. It is important to understand the resource provider’s archiving policy. Unlike print publications, electronic publications may not be maintained on a permanent basis. Consideration should be given to whether the provider is LOCKSS compliant or alternatively, if the archiving solution they use is open-source product compliant. Consideration should also be given to the reliability of any third party archival solution in place. It is important to
understand the content and form of any archive and any associated fees and possible restrictions on copying and archiving of files. Provision for migrating files to new formats/platforms to keep up with technological advances is also worth considering. It is also important to understand the impact cancellation or termination will have on perpetual access to previously subscribed content.

2.4.4.6 Bibliographic Data Provision

The vendor should be able to provide URLs or bibliographic data in the library’s preferred file format which adhere to appropriate quality standards. This again reduces the burden on the library in setting up links or creating catalogue records for access.

2.4.4.7 Statistical Reporting

The availability of quality statistical data is important in understanding how well resources are used and how cost effective they are compared to other products. This is particularly important in supporting renewal and de-selection decisions. The vendor should provide quality statistical reporting following recognized standards such as ICOLC’s (International Coalition of Library Consortia) Guidelines. For Statistical Measures of Usage of Web-Based Information Resources or COUNTER’s (Counting Online Usage of Networked Electronic Resources) Code of Practice.

2.4.5 Supply

Unlike print subscriptions, there is no standard model for the packaging and pricing of electronic publications. It is important to consider the range of
purchase/pricing models available and determine which one best meets the
needs of the library in terms of access and archival rights and value for money.

2.4.5.1 Purchase Models and Pricing

selectors should carefully review the pricing models available for the
resource under consideration as there is no standard pricing model for electronic
resources. Pricing models are often based on a number of criteria and variables
such as the size of the user population and the number of simultaneous users.
One important pricing model for subscription based electronic journals, packages
of e-books, databases, and other similar resources is one based on FTE (full-
time equivalent). It is recommended that where print copies are available,
libraries should confirm that the cost of the electronic copy does not exceed that
of the print version. If the price of the electronic version is higher than the print
version, then this should be reflected in additional value added features such as
functionality and improved access. The selectors should ensure that such
features are worth any additional costs incurred over purchase of the print
version. Purchase/pricing models may include, but are not limited to:

- Separate pricing for content and access.
- Combined model
- Current content.
- Pay-per-use pricing.
- Rental models.
- Consortia pricing.
- Print plus electronic
- Packaged pricing
- Big deal
• Introductory pricing
• Multi-year deals with fixed price caps.
• Patron-Driven Acquisition pricing models

2.4.5.2 Number of Users and Sites

The number of users and sites is likely to have an impact on pricing. The number of users required in a multi-user license should be based on anticipated demand. Where numbers are based on FTE, it should be based on the size on the actual user group and not the total user population, this is particularly important in selecting specialized resources with a specific and limited target audience.

2.4.5.3 Back Files, Archiving and Post Termination Rights

The purchasing or leasing of electronic data should include provision for perpetual access to that data. Following any termination of the license agreement, the institution’s perpetual electronic access to the previously subscribed content should be guaranteed. In such cases, information needs to be obtained to understand likely ongoing access and maintenance costs of content acquired and archived to date.

2.4.5.4 Cancellation Rights

Due consideration be given to the terms and conditions around cancellation. This might be cancelling a bundled deal and moving to selected content or moving to outright cancellation or cancellation of linked print products. Models that impose ‘no print cancellation’ clauses or impose limits on the number of titles or financial penalties should be avoided.
2.4.5.5 Invoicing

Separate invoicing for individual members should be available where purchase is as part of consortia. Pricing should be transparent with content and access fees clearly indicated as separate costs.

2.4.5.6 Renewals

The vendor should notify the library at least two months in advance prior to the subscription renewal date. Where the renewal is as part of a consortia subscription, the vendor should seek confirmation from the individual library prior to renewal. Regardless of the pricing model, consideration needs to be given to the handling of back-files, the duration of the agreement or subscription, the size and type of institution and the number of simultaneous user and authorised sites as each of these are likely to have an impact on the price of the resource. Selectors should be prepared to negotiate with suppliers on pricing. Where a number of resources are acquired from the same vendor, this should be used as leverage to secure improved rates.

2.5 Licensing Considerations for Electronic Resources²

Librarians cannot afford to ignore the implications of license agreements when making a purchase decision. As long as electronic resources are available for lease rights only, examining license agreements will be an integral part of the selection process. The selector has to determine if a license exists, what impact the license will have on the selection and acquisition process and if the rights assigned by the license are adequate for the library's purposes. In particular, the selector must examine issues of user definition, use rights and restrictions and
contractual obligations and penalties. An acceptable license agreement is required before the selection decision is finalized.

2.5.1 Access Concerns

It is recommended practice that the following points governing access by a library’s patrons be covered by any licensing agreement which a library, its governing institution or its consortia signs.

2.5.1.1 Authorized users

These are all persons with a current, authenticated affiliation with the subscribing institution(s). This could include full- and part-time students and employees (faculty, staff, affiliated and visiting researchers and independent contractors). Visitors who have permission to use the institution’s publicly available computers should have access to the licensed resource. This is commonly known as ‘walk-in use’.

2.5.1.2 Authorized Sites

These sites should include satellite facilities in different geographical locations. Authorized users should also have access to the licensed resource from home, offices or any other remote location, through the use of a proxy server or other IP-authenticated protocol as provided by the subscribing institution. This is commonly referred to as ‘remote use’.

2.5.1.3 Method of Access

Access should be permitted via IP authentication for the entire institution(s), including simultaneous access for multiple users, in different
geographic locations, sites. Such access should be provided without requiring the use of a password or other code.

2.5.1.4 Archiving Policy and Perpetual Access

The resource provider should provide a clearly articulated archiving policy for the information being licensed. The resource provider should be LOCKSS or open source compliant. The provider shall grant access to the licensed content of the resource for the mutually agreed time period. The purchasing or leasing of electronic data should include provision for perpetual access to that data. Following any termination of the license agreement, the institution’s perpetual electronic access to the previously subscribed content should be guaranteed.

2.5.1.5 Institutional Archives/Self Archiving

The resource provider should allow an individual institution or author to upload its faculty’s work to its Institutional Repository either in pre, or post-print format. Preferably, the resource provider should provide the post-print version of the work which appears in the resource provider’s publications.

2.5.2 Use of Electronic Information Resource

The license should permit fair use of all information for educational, instructional non-commercial and research purposes. The following considerations regarding fair use, user statistics and liability for unauthorized use should be addressed in any licensing agreement which a library, its governing institution, or its consortium signs:
2.5.2.1 Inter Library Loan (ILL)

Inter library loan should always be permitted. At a minimum, FAX or postal
dispatch of photocopies of printed electronic articles should be allowed. Use of
secure ILL software, such as Ariel or comparable systems for lending to other
libraries should be allowed.

2.5.2.2 Pay-Per-View – Service

Access articles which are not available in the library’s print or online
collections. It should be possible for the library to purchase the article and send it
to the patron via E-mail. Pay-per-view is not a replacement for ILL.

2.5.2.3 Viewing, Downloading and Printing

Authorized users should be allowed to view and print copies and to
download electronic copies of single articles from the electronic resource for
private use, in line with ‘fair use’ provision in the applicable governing copyright
law.

2.5.2.4 Course Packages

Use of the information content from the electronic resource should be
permitted in course packs and other material of an educational nature, as
compiled for a restricted set of authorized users.

2.5.2.5 Course Reserves

Electronic copies of articles or a discrete portion of the information content
from the electronic resource should be permitted to be included in a library’s
course reserves (print or digital), as requested by an instructor for a restricted set
of authorized users in conjunction with specific courses.
2.5.2.6 User Statistics

The information provider should provide statistics for each library’s use directly to the library whether participating individually or as a member of consortia. In case of a consortia, aggregated statistics for the consortia should be delivered to the consortia administration.

2.5.2.7 Liability for Unauthorized Use

The license should reflect realistic expectations regarding the library’s ability to monitor and trace unauthorized use.

2.5.3 Vendor Support and Technical Considerations

The following vendor support and technical considerations should be addressed in any licensing agreement which a library, its governing institution, or its consortia signs:

2.5.3.1 Linking Service

The resource provider should inform the library, if the content in the resource is available via a link server or link resolver. Information should also be provided on how the standard Open URL is supported. This applies to both linking to the content in the resource via the Open URL and linking from the resource content to a link server. The following considerations apply to resources not covered by linking services or when this approach is preferred by the library.

2.5.3.2 Content Consistency

The resource provider should be obliged to inform, if the information content of the offer in question differs from what is available via the linking service.
2.5.3.3 Bibliographic Data

The resource provider should provide an electronic file with bibliographic information for input to the library’s OPAC. This file shall describe the content of the resource (cataloguing data) and shall be delivered in a correct format. The library defines the demanded data quality of the bibliographic description and the required file format.

2.5.3.4 Commencement Date

The license period should not commence before the resource provider has provided catalogue data, as specified by the library, in correct format. Unacceptable data quality may entitle the library to a reduced price for the information content.

2.5.3.5 System Integration

The resource provider should inform the library as to what extent it is possible to link to holdings information and ordering functionality in the library’s online information system.

2.5.3.6 Technical Support

The resource provider should provide contact information which the library can use for technical support.

2.5.3.7 Notifications Process

The resource provider should, at suitable intervals, inform the library of significant changes in content of the resource. Significant content changes include notification of new, ceased or changed titles or changes in the number of volumes available. Such information can be submitted via SFX updates (or via...
similar linking services) or by means of newsletters. If such information is not available via SFX or a similar linking service, changes in resource content should be reported in an electronic file in a format specified by the library.

2.5.3.8 Customer Support

The resource provider should provide sufficient customer support (in accordance with the institution’s or consortium’s specification) to the library or to each participating member library, if in a consortia agreement.

2.5.3.9 Web Browser Accessibility

The information resource should be accessible via use of a standard web browser (e.g., Netscape, Mozilla, Opera, MS Internet Explorer, and Safari) and with capabilities for standard document formats such as HTML or PDF. It is recommended that the resource be readily accessible and usable by individuals with disabilities and comply with relevant disability legislation.

2.5.3.10 Documentation

The resource provider should provide online help screens and/or online user documentation manuals.

2.5.3.11 Guaranteed up time

The information provider should guarantee up time of more than 99% to the resource during the term of the license agreement. Significant interruptions to access that can be documented by the library or consortium should entitle the licensing agency to reduced licensing fees or to an extension of the license agreement commensurate to the amount of excessive down time.
2.5.4 Flexibility and Enhancements

The following considerations should be addressed in any licensing agreement which a library, its governing institution or its consortia signs:

2.5.4.1 Cancellations

The selector needs to ensure that there is no non-cancellation clause and must be clear about the period of notice that must be given to cancel or terminate a subscription or agreement and any restrictions around how many payments must be made before cancellation or termination can be undertaken.

2.5.4.2 Value for Money

The price of the electronic version should be the same or less than the print equivalent. Any increase in price should be reflected in an increase in functionality and accessibility.

2.5.4.3 Consistency with Print Equivalent

The electronic version of an information resource should have the same or better visual quality as the print original, including graphs, charts and illustrations.

2.5.4.4 Availability

The electronic version of a serial electronic resource should be available no later than the printed version.

2.5.4.5 Drop-Out Clause

It should be explicitly acknowledged that withdrawal from the license agreement is possible at the start of each calendar year or of the library’s or consortium’s fiscal year. The library or consortium should provide sufficient
advance notice, as defined in the license agreement, of any intended withdrawal or cancellation.

2.5.5 Legal Issues

The following legal issues should be addressed in any licensing agreement which a library, its governing institution, or its consortium signs. It is generally advisable that the library or consortium consult with its legal counsel before any major license agreements are signed, if such review is not already legally or procedurally mandated at the institutional level.

2.5.5.1 Terms of Payment

The library’s or the consortium’s payment liability should commence from the date that the access is agreed upon by the library and the resource provider and the provider has actually provided access to the information resource content in the specified format.

2.5.5.2 Grace Period

The resource provider shall maintain access to the library or consortium for a grace period of at least one month at the start of each license year, if the renewal payment has not been received.

2.5.5.3 Governing Laws

The license agreement between the resource provider and the library or consortium should not restrict any legal rights of the library or consortium according to the governing laws of the library’s or consortium’s legal jurisdiction (province, state, country). Disputes arising from a license agreement should be
arbitrated in the library’s or the consortium’s legal jurisdiction (province, state, country).

2.5.5.4 Resource Provider’s Authority to Provide Access

The licensor should guarantee that it has all necessary rights to license the resource for the purposes outlined in the agreement.

2.5.6 Review and Renewal Process

Due to the rapid changes in technology, the emergence of new offerings from information providers in terms of the pricing and packaging of content and continued pressure on library budgets made the renewal process still complicated. Workloads in managing and co-ordinating the annual renewals process for continuing electronic resources (i.e. those resources to which the library has a subscription or lease arrangement, as opposed to those it has purchased as a one off outright) should not be underestimated. Like other continuing resources, E-resources will not always have a uniform renewal date, as subscriptions or leases may run for one or more years from any particular date on the calendar.

2.5.6.1 Review of Usage Data

The library should review available usage statistics in order to justify their retention and renewal. As important as e-resource usage statistics are, they alone are insufficient in all instances for making significant selection decisions. Coordination and interpretation of the usage data should always be done within the broader context of the library’s collection development policy and practices.
2.5.6.2 Other Renewal Considerations

Electronic resource is worth considering further for renewal, then it needs to be reevaluated against the selection and evaluation criteria to ensure none of the criteria for selection have changed. Renewals for databases tend to be less complex and onerous than those for print journals, but in reviewing any continuing electronic resource, particular consideration needs to be given to issues including, but not limited to:

- Changes to information provider.
- Changes in operating platform.
- Changes in access provision.
- Changes to pricing.
- Changes in access to back-files.
- Changes to the license.
- Changes to packaging/content available.

By following ongoing evaluation and review against the library’s electronic resource collection development, the library should be able to ensure that library budgets continue to be spent on resources that support the mission and objectives of the institution and remain relevant and cost effective.

2.6 Acquisition of Electronic Resources

Similarly, due to the overwhelming growth and availability of a variety of electronic products, the workflow of acquisitions has changed significantly, becoming more complex. Though the acquisition process is closely connected to collection development in any type of library, it has distinct functions. The primary objective of acquisition is getting the materials needed by the library’s users in the most desired format and in the most efficient and economical manner. Thus,
acquisition is defined as the technical process of ordering, receiving, and paying for an item after the intellectual decision to purchase an item has been made. Even though the process of identifying, ordering, and paying for materials such as books, serials, and media is very similar to that of electronic formats, the lifecycle of e-resources is more convoluted than that of print resources. It requires additional levels of details including tracking, recording, and reviewing the license and business terms, and Selection policy investigating variable pricing ranges. Acquiring information for an electronic product is often much more time-consuming than for print resources. It requires more time for decision making at every step as well as higher levels of skills and knowledge among staff. Also, it can require additional budget allocations due to higher subscription costs than for print collections. Due to the increase in the number of electronic formats, acquisition librarians are no longer just an expert in acquiring materials, having knowledge about publishers and book vendors, and identifying incomplete citations as well as finding out-of-print materials. Now they are also responsible for solving more creative problems in the areas of collection development, licensing, cataloging, technology and other issues related to e-resources. Finally, the renewal and cancellation of serial subscriptions are a systematic recurring process in any type of engineering college library. Due to high inflation rates for serial subscriptions in all formats, shrinkage of budgets or buying power, and the emergence of new products, selectors are required to assess their collections for potential cancellations during the renewal process. Several traditional criteria are considered for reviewing serial subscriptions, such as low usage data, significant
inflation rates, cost per issue, type of publication, relevancy, quality, duplication in other formats, and coverage in index and abstracting services.

The acquisition is a four-step process that begins after the selector discovers a new product. It includes verifying the bibliographic information for the product, identifying various pricing options, reviewing the license and business agreements, and finally, ordering and acquiring the product for the library collection.

2.6.1 Verification of Bibliographic Information

The verification of bibliographic information for an electronic product requires finding out various details such as the content provider of the product, coverage, frequency of updates, and cost. Sometimes the same product may be available on multiple platforms or in more than one package. It is vital to understand various content providers’ platforms and provide details to the selectors because they may have different content coverage; pricing; interface, search or retrieval capabilities; and user functions. Although acquisition librarians find various details from the publisher’s Website, most of the time they have to work with a representative of content provider for clarification on various aspects of the product and for pricing and business negotiations. There are other tools that can be used for verification of bibliographic information, such as World Cat (http://oclc.org/worldcat), Ulrich’s Periodicals Directory, and Serials Directory.

2.6.2 Identification of Various Pricing Options

Content providers offer various pricing models. They may be based on the size of the library, the number of users, or the nature of the product.
Unfortunately, there are no consistent standards for pricing, and acquisitions/ER librarians need to negotiate a final price or pricing model. Some common pricing models are as follows:

2.6.2.1 Product Type

There are various types of products, for example, electronic journal packages, aggregator databases, and full text databases. The pricing model may depend on the type of product, which may also be available through various options, such as yearly subscription or one-time purchase for archival products.

2.6.2.2 Institution Size

The size of the institution is another variable. The content provider may charge more when selling to large universities with multiple branches, locations, or sites compared to small sized universities or community colleges.

2.6.2.3 Number of Users

Price also varies with the number of potential users. Some content providers offer price based on full-time equivalents of students, while others include the total number of students, staff, and faculty members as potential users. Price may also be based on the number of simultaneous users or unlimited access including remote access, and so forth.

2.6.2.4 Consortia

Often content providers offer special pricing for consortia. In consortia deals, expensive electronic products can become affordable for small libraries because several libraries work together and share costs.
2.6.3 Journal Package Deals

Some providers offer bundled sets of titles in an electronic journal package. The library or consortium must acquire the entire list of journals without any individual selection. In such a deal, libraries may get relevant content at a lower price but may have to pay for titles with less or no relevance for the users; whereas, some providers of electronic journals packages offer pay-per-view options. In this option, libraries are not required to have subscriptions to all journal titles in the package, allowing users access to articles by paying the cost of an article from journals that are not subscribed to by the library. Sometimes, Pricing models are based on a combination of print and electronic subscriptions. In such cases, publishers offer free electronic access or provide deep discounts for print plus electronic subscriptions.

2.6.3.1 Content Access

Sometimes pricing is based on the type of access to content. Some content providers require libraries to pay a large initial fee and then smaller annual fees for electronic packages where the annual fee is generally for continued access, which may or may not include additional content. Moreover, pricing depends upon the level of the content. Databases with full-text articles have higher prices compared to abstract and indexing databases. Thus, each pricing model is unique and variations seemingly limitless. Acquisitions/ER librarians explore the above options with content providers and report their findings to the selectors. Most electronic journal packages are available directly from the publishers, while individual journal titles may be available directly from
the publisher or through a subscription agent or another content provider. Electronic books can now often be purchased through a major book jobber as well as from the publisher or as a package deal through a third party, which may or may not be a consortium. Some expensive electronic databases or packages can be obtained directly from the publishers or by joining a larger consortium. Due to the high cost of e-resources, many libraries prefer a consortia approach in acquiring those resources. As a result, consortia play major roles in acquiring expensive e-resources. Purchasing through a consortium results in significant financial savings to individual libraries, which allows for wider access to materials for users. Reviewing the License and Business Agreements Once the source of acquiring the product is determined the license agreement becomes the key part of the acquisition process. The license agreement includes description of the product, responsible parties that is, licensor and licensee who are signing the agreement, authorized users of the product, use of the product, and rights of the licensee and the licensor. Inquiring about the license agreement with a representative of the content provider before ordering the product is recommended. Many content providers make available their licensing agreements and terms of use on their Websites, while some licenses can be obtained through their representatives. Sometimes, publishers have “click-on” or “click through” licenses on their Websites, where a user is required to click on a box to agree to the terms and agreements of the products. It is a normal tendency of the user to simply agree without reading the terms. In such scenarios, the acquisitions/ER librarians must review the agreement. If certain
terms are not acceptable, then they should be negotiated with the publishers. It is most critical to get the contract reviewed and signed by both parties before the invoice of the product is paid. Licensing is becoming a day-to-day responsibility of an acquisitions/ER librarian and is the most important issue these days since it concerns a legally binding contract made on behalf of the institution. The challenges associated with the licensing agreement include understanding the content, determining the standard wording required by the institution, and identifying terms, which requires negotiation. Librarians who deal with licensing agreements should have negotiating skills and be required to work collaboratively with the institution’s legal counsel. They should be familiar with the policies of their institution. Librarians responsible for licenses should review each term and condition in the agreement very carefully. While reviewing the agreement, one should assure that each provision is clear. Librarians must work closely with content providers while reviewing the agreement and should make necessary changes to conform to the institution’s policies. Almost all licenses are negotiable but require considerable time. Thus, librarians must be patient and persistent (Wilkinson & Lewis, 2003). If necessary, they should actively negotiate the terms, keep communication open and clarify the institution’s service expectations. The license agreement contains various clauses that define the rights of the libraries, users, and content providers. The following are some of the important clauses included in the license that can act as a checklist for the librarian who reviews the license agreement:
2.6.3.2 Content of Licensed Materials

The license should clearly include the name of the product or the list of the titles that can be accessed.

2.6.3.3 Site

It is important to include names of the sites/premises that have authorized access to the product. Sometimes access to the product is limited to a particular building or campus, and it is necessary to name them in this clause.

2.6.4 Authorized Users

Definition of authorized users is an important clause in any license agreement. This clause defines authorized users such as students, faculty, and staff of an academic institution. Many public institution libraries require authorized access for public walk-in users who occasionally visit the library. This clause should be reviewed carefully and negotiated if necessary.

2.6.5 Copyright and Fair Use

Copyright and fair use laws of the United States allow libraries to make copies of some portions of the material and send them to other libraries for educational, research, and teaching purposes. The license agreement should allow users to view, download, or print a copy of the material. Some providers support library services such as interlibrary loan, electronic course reserve, and distance education. Librarians should carefully review this clause, identify the institutional needs, and include them in the agreement.
2.6.6 Confidentiality

Some agreements require libraries to keep the cost of the resource confidential. It is not possible for public institutions to accept such a clause. On the other end, libraries should protect the confidentiality of the users. Thus, this clause should be reviewed carefully.

2.6.7 Cost

This clause should clearly include the cost of the subscription.

2.6.8 Governing Law

Most of the time a publisher stipulates in the terms that the contract will be governed by the laws of the provider’s particular state or country. Librarians should be very careful in reviewing this clause and should be aware of their institution’s policy. It is important to negotiate this clause and change the governing law to the geographical location of the institution.

2.6.9 Perpetual Access

This clause allows the library to retain access to the materials for which payment has been made after cancellation of the product. Libraries should ask for archival access if it is not included in the contract.

2.6.10 Terms of Payment and Termination

This clause includes payment of invoices within certain time frames as well as requirements for the renewal of the contract. It is important to review this clause and make necessary changes before signing the agreement. Termination includes reason and time of termination and notification from the provider.
2.6.11 Indemnification

This clause states that one or both parties will not be financially responsible for any monetary loss. This clause should be carefully reviewed and needs to have equal indemnification for both parties. Generally, the contract term also includes the phrase “hold harmless,” which means that legal action will not be taken against the other party.

2.6.12 Usage Statistics

Under this clause, the content providers agree to provide usage statistics for e-resources. The data should be compliant with Counting Online Usage of Network Electronic Resources (COUNTER), which helps libraries to compare usage statistics and make informed decisions for renewal or cancellation of e-resources. Though librarians are becoming savvy in negotiating the terms and conditions of licenses and the content providers are becoming more familiar with libraries’ needs, it is important to have consistent and transparent clauses. As of the time of this writing, there is no standardization in the agreements. Clarity and standardization in agreements would be beneficial for librarians as well as content providers.

The workflow of the licensing review process varies according to the type and size of a library. Some libraries have a team approach for license negotiation, while in some libraries legal counsel reviews the licenses. In some libraries, once the acquisitions/ER librarian reviews the license and negotiates the terms, it is sent to the institution’s attorney for final review. Lately large subscription vendors have also started participating actively in the licensing
process. They have started providing a new service for the library by interpreting the terms of a contract and negotiating on the library’s behalf. It is also very important to keep copies of the signed agreement in the acquisitions department for future reference. Ordering and Acquiring the Product After the license is reviewed and signed, ordering and acquisition of the product begins. Acquisitions personnel communicate with the content provider about the resource that is being requested and provide technical information, such as Internet protocol (IP) addresses. The acquisitions department gets phone or e-mail notification from the provider’s technical support staff once the access is set up based on the institution’s request. The content provider also provides a stable URL for the product through which the resource can be accessed. Acquisitions or technology personnel verify access of the product and inform the rest of the organization of the availability of the new resource. The acquisitions department must notify other library departments such as cataloging, technology, collection development, and public services once access to an e-resource is activated. It is essential to communicate with the cataloging department regarding access to the resource because they maintain the online public access catalog (OPAC). They also need all the details such as license restrictions, if any, content availability, mode of access, simultaneous use access, and so forth. The acquisitions department informs the technology or systems department because they maintain the technical access and local tracking of the database. The acquisitions department also informs the selector who requested the product and the public services staff who publicize the new resource to users. It is important
to share details about contractual and legal terms such as acceptable and prohibited use of the resource and the number of authorized users. Timely communication between the acquisitions department and various library departments is vital to ensure rapid access to the product for the user. Sometimes content providers offer training in the use of the resource once it is acquired by the library. In such a case, the acquisitions staff follows up with the provider’s representative regarding training for public services staff. Periodically they also provide refresher training for the e-resource purchased by the library. The acquisitions librarian should take advantage of such offers to set up training for staff members. After access is confirmed, the provider sends an invoice to the acquisitions department for payment. Acquisitions personnel review the invoice to make sure that the charges are as per the agreement and then process the payment. The responsibility of the acquisitions department is not over as soon as the item is paid for maintaining access to the resource also becomes a part of this department’s task. Sometimes, access is disrupted due to a delay in the renewal of the resource. In such a case, acquisitions personnel need to contact the provider immediately to resolve the issue. Frequently access is affected due to technical problems such as a change in the URL. Under such circumstances, acquisitions or systems personnel should follow up. It is important for acquisitions personnel to communicate with the provider whenever there is a change in the IP address so records can be amended and access provided to additional buildings or sites. Another ongoing responsibility of acquisitions personnel is to receive usage statistics from the provider and provide data to
selectors so that they can review the usage and make informed decisions about renewing or cancelling the resource.

2.6.13 Renewal/ Cancellation of Electronic Resources

Unlike most serial renewal subscriptions, which are based on a calendar year, the renewal for electronic subscriptions depends on the individual contracts. The majority of them are renewed every year, but sometimes contracts are signed for two or three years and are renewed accordingly. Usually, content providers send a reminder to the library’s acquisitions department for renewal ahead of time with pricing and a copy of the contract. The core e-resources are most of the time automatically renewed unless there is a significant increase in the price or a change in the licensing terms. But noncore electronic subscriptions are reviewed by selectors based on various evaluation criteria before the renewal is processed by acquisitions. Once the invoice is paid, generally refunds are not available. Thus, evaluation of resources before the renewal process is critical. During the evaluation process for renewing e-resources, selectors consider various criteria such as ranking based on quality and usage, access, cost-effectiveness, breadth, audience, and uniqueness of the resource:

2.6.14 Ranking

The databases can be ranked by acquiring based on usage statistics.

2.6.15 Access

Access criteria are based on the technical reliability of the content provider, ease of use, remote access by users, and perpetual access. However,
when the perpetual access/archive is not available or if a title is cancelled, the library loses access to current as well as retrospective material.

2.6.16 Cost-Effectiveness

Cost-effectiveness is based on the number of searches per year, cost per search, and so forth. Usage data and especially cost per use helps in assigning the title for renewal or cancellation. The pricing for e-resources is very different compared to print resources. The price per title and the cost per use are extremely difficult to evaluate. Assessment of usage data from providers is extremely valuable for selectors during the renewal process, especially for evaluating expensive resources. Some content providers provide useful statistics such as number of queries per specific database, number of sessions, number of full text articles or citations retrieved, and the number of times users were denied access. Such data can help selectors to increase the number of simultaneous users during the renewal process. There is still inconsistency in usage data received from the providers despite standards developed by COUNTER, and libraries should encourage the content providers to provide such data.

2.6.17 Breadth and Audience

The breadth and audience criteria include the relevance to research on campus and the curriculum, the potential number of users affected, the primary user group, and the number of searches per year.

2.6.18 Uniqueness

Uniqueness of the resource can be evaluated by comparing duplication in various formats or overlap in full-text resources. Individual titles in a publisher
package generally cannot be cancelled. Sometimes, the titles are duplicated in aggregator databases, which do not provide stable access and hence require renewal of the subscription.

2.6.19 Budget

Finally, inadequate budget adds challenges for selectors in making decisions for renewal of e-resources. Once a decision has been made, the acquisitions department is notified to renew or cancel the subscription. They process the invoice for payment or communicate with the provider for cancellation.

2.7 Management of Electronic Resources

The development of information technology and the Web environments have a dramatic effect on the user behaviors in information usage. The work flows from acquisitions to user services and the life cycle of electronic resources is quite different from that of print resources, since it is characterized by access without holding the physical objects. Also, the functional responsibilities for managing electronic resources are often distributed over departments such as serials, acquisitions and library systems. As licensing electronic resources has greatly increased in recent years, libraries have struggled to control this information in paper files, integrated library systems, separate databases stored on local computers or network. Under these circumstances, the need to get a better handle on these resources has grown.

The Electronic Resource Management System (ERMS) should offer an integrated environment that supports both management and access, without
maintaining duplicate systems. The system should offer a capacity for global updating and flexible addition of fields. It should offer the ability to hide fields and records from public view and have a single point of maintenance for each data element. It should support inter-operation and dynamic data sharing with existing OPACs, Web portals, library-management systems and link resolution services. It should offer to user, consistent information regardless of the path they take in seeking it. Finally, the ERMS should, over time, support the ability to store, access, search and generate reports of the information that it contains.

2.7.1 Functional Requirements

2.7.1.1 Bibliographic Management Requirements

In many libraries, both traditional and auxiliary bibliographic data may be distributed among a variety of systems, including the library-management system, a federated searching portal and a link resolution service. Nevertheless, to the extent possible, each unique data element should have to be maintained only once. Updates in one system should be automatically reflected in corresponding systems, either through the dynamic sharing of data or where redundant storage cannot be eliminated, by propagation to other systems. Loading of data from external systems should also be supported.

2.7.1.2 Access-Management Requirements

All libraries rely on authentication and access-management systems that are external to the systems and tools. These external systems may be as straightforward as reliance on the remote-authorization mechanism of an online provider (via IP addresses or user names and passwords) or as complex as a locally
developed access-management service that assigns persistent identifiers to resources, passes connection requests to a system that validates users according to a local authentication scheme (e.g., Kerberos) and routes valid users through a proxy server. Institutions with complex local environments can be expected to have customized systems and tools with which to perform these functions and the ERM system must inter-operate with them. The ERMS should accommodate both simple and complex environments with a disparate range of needs.

2.7.2 Staff Requirements

2.7.2.1 Staff Interface

An ERM system requires a staff interface that enables library staff to efficiently carry out the work described in the sections that follow. The interface should be organized to optimize for staff activity or interest, such as resource acquisition, troubleshooting, license administration or administration and statistics.

2.8 Preservation of Electronic Resources

In the recent past, the libraries, worldwide, have increased their expenditure on e-resources phenomenally. An Electronic resource is defined as any work encoded and made available for access through the use of a computer. It includes electronic data available by remote access and direct access (fixed media). Remote access (e-resources) refers to the use of e-resources via computer networks. Direct access refers to the use of electronic resources via carriers) e.g. discs, cassettes, cartridges) designed to be inserted in to a
computerized device or its auxiliary equipment. The trend to procure and maintain e-resources has grown exponentially among the libraries. This is due to the changes in the information seeking behaviour of users. They are showing greater interest and reliance upon E-resources and libraries & publishers to meet their potential information requirements by providing the same. This has been substantiated by many survey findings. At present, most of the E-journals have their print counterpart.

It is an issue of concern when print resources, which are 100 years or more old are to be stored and maintained for posterity. But in digital environment, the scene is completely different. Therefore, preserving digital information resources is a continuous problem.

2.8.1 Need for Preservation of E-journals

Since the e-journals have become the mainstay of the academic libraries’ collection, preservation and archiving is very much essential to ensure seamless, uninterrupted access to them in future. The generation of new scientific knowledge is not possible, until and unless access to already generated knowledge of past is made possible. The faculty members, researchers, and students are highly dependent on e-resources for their research work. In traditional environment, libraries are maintained as proper physical infrastructure, including brick and mortar building with racks and shelves for ensured maintenance and access of back files of journals for years together for the user community. In online environment, libraries have access to journal content, but the access is not ensured for various reasons—the publisher may go out of
business, the physical infrastructure may collapse due to vagaries of nature, publisher may cease publication of journal. Once the subscription is dropped (or publication becomes a ceased one), libraries are deprived of back issues of journals. This uncertainty of continuing access is a major hurdle which prevents libraries from moving to electronic only subscriptions. So, libraries need to archive electronic journals before they can completely shift to e-journals only. Since the libraries spent a substantial part of their budget on E-journals, they must protect the investment they make on e-resources. Hence, digital archiving of back files of journals is very important in order to provide seamless access to the digital content to the future generations. The aim of archiving or digital preservation is to make available the e-resources accessible and usable to the posterity.

2.8.2 Digital Preservation: Meaning and Purpose

Digitization is being carried on large scale, worldwide to facilitate and ensure wider dissemination and access of information. Universities, worldwide spend huge amounts of money on digitization for long-term gains ensuring access for long duration. So, preservation should be considered an inherent part of digitization activities.

2.8.3 Archiving—Print Journals vs E-journals

A printed journal is a physical object; whereas an e-journal is not a physical but a logical object stored on a physical medium. A printed journal presents the information so that it is immediately accessible to the human eye and can be read directly. To view an e-journal specific software and hardware is
required. The digital publication deteriorates much faster than paper. The format of the digital object may be damaged or lost and thus become irretrievable. But even before that happens, the technology used to store the publication is likely to become obsolete. Another threat is the loss of the functionality needed to interpret, display and use information contained in the digital object; without this functionality—the provision of specific hardware/software, the information will not be available even if the bit stream of the digital object has been preserved. It is a very complicated process and requires lot of innovations in institutional and business models, technology infrastructure, social and legal frameworks. Preservation of e-journals is particularly challenging due to extensive diversity and complexity of data structures in use over time and across the publishing community. The archival holdings may be accessed infrequently—several cycles of technology evolution may occur in between accesses to digital content, thereby causing corrupted files to remain unnoticed for long. Besides, the digital content may have to undergo quite a number of migrative transformations due to format obsolescence. These transformations and up-gradations may change the digital content in different ways. Since digital preservation poses lots of problems due to fast pace of technology development, fragility of digital information and computing infrastructure, a well developed strategy needs to be formulated to attend to the following requirements:

1. Encapsulation of information of content, context, structure of digital object in order to enable long term maintenance.
2. Efficient management of evolution and up gradation of hardware and software with proper handling of technology obsolescence.
- Effective recovery mechanism from technology degradation or failure or natural disasters—fire floods, earthquakes, human-induced operational errors.

- Effective ways to ensure the authenticity and integrity of content and structure of archived information Ability for information discovery and content access and preservation with an automatic enforcement of authorization and IP rights

- Scalability in terms of ingestion rate, capacity and processing power to manage and preserve large scale heterogeneous collections of complex objects.

2.8.4 Issues and Challenges

2.8.4.1 Selection of Content

There are an ever growing number of journals. So it is essential to decide upon the preservation priorities. The decision can be made after discussions with libraries, publishers, users, research scholars and faculty members. At this stage various issues have to be taken care of like—what content of the journals should be archived? E-journals have content like editorial boards, rights and usage terms, copyright statement, journal description, advertisements, reprint information, editorial, errata, conference announcements, various kinds of digital files. Besides, the digital content may be in a variety of formats which may affect the maintenance cost. An archive may decide to normalise digital objects in some preferred formats. For example, an archive may store all raster images in TIFF and convert JPEG or GIF image into that format.

2.8.4.2 Strategies for Preservation

There may be following different option for preserving digital content for future use:
• Medium refreshing: It is copying digital files from one storage medium to another medium.

• Data migration: It is transfer of digital materials from one hardware/software configuration to another.

• Technology preservation: It means preserving an information object together with all of the hardware and software needed to interpret it.

• Software emulation: It helps in imitation of another software to accept same data, execute same programme and achieve the same results as that of imitated system.

2.8.4.3 Continuous Management and Maintenance

Digital preservation work is constant; it should not be taken up in fits and starts. It requires continuous and active management; the digital archive requires continuous regular maintenance to keep it secured, including regular processes to check the fixity of files—find out if the content is corrupted and needs to be repaired to ensure replications.

2.8.4.4 Financial Constraints

The libraries may find it difficult to convince authorities for release of funds for digital archiving. They may lack far sight to invest in digital archiving, rather they may prefer to invest in widening their resources. The administrators and policy makers need to be more sensitive and understand the importance of archiving activities. A percentage of total library budget should be allocated for archiving programmes.

2.9 De-Selection of Electronic Resources

Over period of time, the acquired E-Resources be reviewed particularly standalone floppy diskette/CD-ROM/DVD-ROM and other media formats and be
removed based on their use. Particularly the E-Resources available in physical format like floppy diskette/CD-ROM/DVD-ROM, Pen Drive etc., are prone for damage. Therefore, the damaged electronic formats be De-Selected following a well established procedure.

2.9.1 Guidelines for De-Selection

- Periodic examination of electronic formats in the collection for De-Selection is conducted.

- Besides a duplication policy and weeding policy in the collection development policy, the following guidelines will also apply.

  1. Materials non-circulated and not used for many years.

  2. Materials not compatible with existing hardware and software and/or not supported by the vendors. Obsolete formats and platforms are not supported.

  3. Outdated or inaccurate materials.

  4. Content is duplicated in available preferred formats.

  5. Materials damaged beyond repair.

Formats which are becoming obsolete should no longer be selected for purchase. Replacement/substitutes in a desirable format should be sought if, connects are unique and deemed invaluable to research.

It is understood that various resources using in engineering college libraries and, Various steps to be taken in Selection of E-Resources, Evaluation of E-Resources, Licensing aspects, Acquisition of E-Resources, Management of E-Resources, Preservation of E-Resources and De-Selection of E-Resources.
REFERENCES:

