

Challenges and opportunities of e-resources

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The advent of e-resources and their increased use have changed the library scenario from physical to virtual. Users' preferences are more for e-resources and virtual libraries with little attraction for physical libraries. In spite of innumerable advantages of e-resources, there are certain problems also relating to their acquisition, maintenance, management, etc. which need collaborative efforts of professionals and all other bodies associated with creation, distribution and use of these resources to establish the sound practices and the models. The paper highlights these issues, emphasizing the need to develop or procure an ERMS which can integrate all these resources along with printed material to provide single window approach to all resources available locally as well as globally in a universal library.

Keywords: electronic resources, collection development, pricing, archiving, ERMS

Introduction

Information technology has made a profound impact on availability and accessibility of e-resources. To provide quick and comprehensive access to resources by using best possible tools and techniques is the ultimate aim of every library. Multiple resources in the present electronic environment can be seamlessly integrated with a single login gateway which makes it user friendly.

Among all academic electronic resources, the advent of electronic journal has been called the greatest revolution in the capture and dissemination of emerging academic knowledge¹. Elsevier who is forerunner in production of e-resources and one of the largest publishers of scholarly journals had realized much earlier that the advent of e-resources is tidal wave of future. Accessibility to limited resources which used to be satisfying during 1970s and 1980s is too inadequate in the present environment to cope up with the exponential growth of literature. Today, e-resources are in abundance, available individually or through package deals from the various publishers.

Most of the academicians today have become Internet dependent. It is the contribution of information and communication technology and impact of Internet that information processing, storing, searching, dissemination and use have become expeditious, easy and user-friendly. Today, digital technology is available at our doorstep, capable of effectively creating and capturing information in various formats, making these available to others². E-resources are available

with increased accessibility beyond time and space restrictions, restricting information users to visit physical libraries. This technology has fulfilled the long dream of Charles Jewett who had conceived the idea of *universal library* more than a century ago.

Impact on user behaviour

The impact of communication technology on user behavior and attitude has been tremendous. Communication pattern in local research environment significantly influenced e-resources use³. Usability of e-resources depends on the facilities available to use them whereas use of printed material is less dependent on technology. Therefore, usability of e-resources has been increasing with the improved Internet facilities. There is a sea change in the users' behaviour and attitude in information searching and use. In the present electronic environment, user is highly impatient and time conscious, wants information *just now or never*. So, libraries are forced to change from physical to virtual environment and make available tools and techniques so that flow and use of information is simple as well as effective. As printed material have their own merits, they have not been replaced completely by e-resources. Therefore libraries have to continue functioning in a hybrid environment.

Publication of e-books is increasing but their acquisition represents only a small proportion of acquisition of the academic libraries⁴. However, its sales grew exponentially in the first quarter of 2010 at least in US jumping from 1.5% of total US book sales

in 2009 (International Digital Publishing Forum, 2010). If users' behavior and attitude towards e-resources are taken into account, libraries are bound to shift from print resources to e-resources to meet their preferred approach towards e-resources. The users' information seeking behaviour can be summed up as under:

- Least reliance on physical structure of libraries
- More dependence on online world.
- Convenience and instant availability and accessibility are dominant consideration.
- Highly impatient '*just now or never*' is the common behavior. They like to have libraries on their desktop computers or laptops, palmtops, even on mobile and iPods⁵.
- Get satisfied with whatever is easily available even at the cost of standard and quality.

It can be summed up that the e-resources have arrived with their own problems and opportunities. The first and the foremost impact of e-resources revolution on libraries is about collection development followed by pricing, maintenance, archiving and management. Some of the confronting issues are discussed in the following sections.

Collection development

Materials collection irrespective of forms and types is the foundation of any library. Therefore, digital collection should respond to the users' needs and provide an appropriate balance between quality and demand⁶. Quality assessment of e-resources is more difficult than printed materials. Therefore, collection development of e-resources is essentially more complex than the printed resources. Moreover, librarians have been dealing with print resources for centuries and are familiar with their acquisition procedure and practices which are well established and standardised, whereas acquisition of e-resources still remains fluid. Librarians alone are not in a position to take decision in selection of serials particularly when these are being licensed under consortium pricing. Some specialists dealing with e-resources have worked out following parameters for evaluation of e-resources:

- Content
- Conditions of access
- Updatability
- Convenience of cataloguing
- Longevity
- Convenience of use
- Statistics of use

- Technical characteristics and quality of service
- Factors of value added
- Structure of price formation⁷.

The decision to subscribe print or e-version or both is important. Further consideration is whether individual journal is to be subscribed/licensed by the library itself or depending upon the resources available under consortium. Access to resources which were being subscribed is denied after the expiry of the subscription period unless perpetual access is agreed upon. Such problems are not encountered in print resources which are owned for perpetual use after purchase. Today, accessibility is the target not the ownership which has its own problems. There are different terms and conditions of accessing, downloading and printing of information which are even under subscription, such as you may not be allowed to download whole issue of the journal, may not send article through e-mail, may not store articles for future use, etc. The costs of e-resources are not fixed as of printed resources which varies depending upon various variables like number of concurrent users, level of access, nature of the institution, different renewal policies, etc.

There are five important elements of collection development: Budgeting, type of material, selection, acquisition and evaluation⁸ to be taken into account by all libraries. The whole process of e-resources is comparatively more challenging.

Collection development of e-books has its own problems of acquisition due to unpopular pricing model, publishers' embargo, etc. Reading of e-books is still not as convenient as printed books. Packages of e-books are costly. In the present scenario, e-books and printed books are complementary and supplementary to each other having their own advantages. Challenge with the library profession is to build collection based upon the users' demand and preferences anticipating the future and allocate funds both for e-books and printed books accordingly, keeping the balance between the two perhaps with increasing trend of allocation of funds for e-books. Libraries need to develop separate collection development policies for each type of material for proper decision making. All types of material that are in use and in demand have to become the part of e-collection.

Libraries shall have to continue their dual collection development policies in hybrid environment in which printed and electronic resources

are to be integrated to meet diverse needs of communities they are expected to serve. Libraries shall have to change and adapt to the new environment keeping the future needs of users in view. It is important to consider the range of purchase, pricing models available and determine which one meets the needs of the library in terms of access and archival and value for money⁹. Every library today has to add e-resources along with printed material which requires knowledge of pricing policies and models of different publishers as well as scope, coverage and usefulness of data resource so that right choice in selection of resources is made¹⁰.

E-resources and consortia purchase

In the present era, only collaborative efforts can be sustainable. The cooperative purchasing of e-resources through consortia seems to be surviving hope for the profession, though consortia purchase has also its limitation where resources seems to be huge and attractive but with least utility. Foolproof solutions are neither with the publishers nor with the library profession. Proper solutions are being sought at both ends. The advantages of consortia purchase have been summarized by Kaplan⁸ as under:

1. Hold on rising cost
2. To win additional support from local, state, federal Govt.
3. To introduce non-conventional (computerized services)
4. To widen the base from state to region and to nation
5. To narrow the gap within cooperatives between readers who are best and worst served.

The concept of library cooperation and sharing of resources has been as old as the libraries themselves. Self sufficiency has always been an impossibility even to the richest library in the world. Pooling of resources and sharing seems to be only solution to cope up with the present scenario. E-resources changed the whole scenario of the library profession. Acquisition policies have changed, individual purchases by libraries have lowered, interdependence among libraries is on the rise, substitutes for library services are available and dependence on physical libraries is becoming lesser and lesser day by day. Electronic resources are purchased more through consortia providing wider accessibility by minimizing cost of resources to a great extent. To become the

member of a consortium has become almost essential for every library. Big deals are negotiated by the library consortia where many thousands of journals and e-books are made available to access and use. However, not everyone accepts that in a 'Big Deal' that all of this material is actually used. Some skeptics believe that in Big Deal (and the like) there is a good deal of wastage and the availability of such huge digital resources to the user inevitably means that a good deal of these titles, and many of their articles, go unused, or are little used⁹. Similar is the view of many professionals. Jim Mouw of University of Chicago observed that there is a problem when database includes 5000 titles of which 300 might be meaningful for academic use.

In consortia purchase, libraries have to accept predefined package which of course seems to be quite affordable to libraries but may not be cost effective in terms of usability. Nevertheless, in consortia, large electronic resources that are prohibitively expensive for individual libraries become affordable when several libraries work together and share the costs¹⁰. It is the collective needs of the members of the consortium which is taken into consideration sacrificing the individual needs of the libraries. Selection is not strictly need-based of local community. Therefore, consortia collection may not be representative of all the participating libraries equally. Normally, consortia selection and pricing are negotiated and paid by the apex funding agency. Efforts are being taken to conduct surveys of all participating libraries to make proper assessment of users' needs and resources.

Pricing of e-resources

The greatest enigma of e-resources is pricing which are not fixed as in case of printed material. In subscribing printed journals and purchase of printed books, there are hardly any such problems. There are fixed prices and subscription rates subject to verification if required. There is no standard pricing models for e-resources as yet. Different publishers have different policies which go on changing from time to time. It is difficult to remain in touch with these changing models. For example, Oxford journals policy for 2010 onwards included price of online journals as '*base*' rather than print-plus-online or combined price. In these instances, the print only price will be 110% and combined price 120% of the online only price. Some publishers and vendors may deal with e-journals only, some may give offer for

both e-journals and e-books together with additional benefits of accessing open sources. In brief, it may be stated that there are as many models as the publishers which may further vary from vendor to vendor.

There are different subscription rates depending upon various factors like number of users, availing of inter-library loan, duration of subscription, level of use, on standalone system, on Local Area Network, with IP address or on Proxy Server etc. Ables¹¹ described the early stage of pricing which included 'connect time, flat fee per search, computer resources, subscription or flat fee-pricing per year, differential by time of day, 'free with print version.' 'Free with print version was to promote the use of e-resources in the beginning. At the same time during late 1980s and in the beginning of 1990s many databases started coming on CD-ROM with different pricing policy which was much cheaper than online access providing more facilities of searching and onetime payment of purchasing of databases on CD-ROM. Many pricing models include number of potential users under a local network, FTE (Institutional fulltime equivalents) etc. Some of the models based upon different matrix are discussed here.

Number of concurrent users/FTE, nature of institution (some concession is given to smaller institution), more subscription to specialised institutions being less in number, perpetual access/subscription for a specific period, different renewal policy; long term/short term subscription, access to back files, access through IP addresses/Proxy server, archival license, site restriction, pay-per-view, offer of open access sources with subscribed package, length of time of access (five years access may be concessional) are some of the models.

Pay-per-view policy of some publishers like OVID ScienceDirect allow users to purchase as many articles as required using their credit card by opening an account. ScienceDirects charges \$31.50 per view. Pay-per-view or pay-per-use creates barrier that affects the frequency of online access and download, observes Tenopir¹². Consortia prices are much different than subscribing individual titles. Librarians have to negotiate the subscription rates as subscription rates/outright purchase are not fixed. Terms and conditions of the license of different publishers are also different. Publishers want to protect their own interest which may not suit the librarians. Therefore, these terms and conditions also shall have to be negotiated. Librarians still have to negotiate to settle

good deal with the publishers or vendors as the case may be.

Bundle pricing has its own problems in which many titles are aggregated into a single product based upon subject areas which then is marketed and sold as an all-or-none at all. To avail bundle pricing of e-journals, libraries have to cancel other individual titles which may be more useful. It is not affordable to avail both pricing models for most of the libraries. The bundle pricing may suit only those institutions which have more diverse needs may not be suitable for specialized institutions. However, evaluation of these resources in the terms of usability is difficult. Bundle pricing for e-books is equally complex in which thousands of titles are put together under bundle pricing model. Publishers are interested to offer bundle price for all their publications. It is not easy to make the exact assessment of the usage of the package and take right decision whether to go for bundle pricing or purchase selective titles by paying more for individual title. No doubt, that this pricing model gives access to a wide range of collection, but usability of all the resources contained therein cannot be ensured in advance. Suitability of pricing model has become important for acquisition of e-resources.

It is difficult to remain in touch with these changing pricing models. For examples Oxford journals policy for 2010 onwards includew price of online journals as 'base' rather than print-plus-online or combined price. In these instances, the print only price will be 110% and combined price 120% of the online only price. ScienceDirect has bundle pricing model based upon number of articles downloaded:

500 articles	US \$ 10,000
200 articles	US \$ 5,000
100 articles	US \$ 2,800

The summary of the pricing models/conditions of different publishers is given below:

- Subscription may vary on the size of the library users, number of users accessing the database at a time and size of the network, FTE/concurrent users, etc.
- Access to back volume may be given up-to a particular period of time along with current subscription depending upon the availability of back files
- Some publishers may offer subscription of print journals along with e-version at 10-20% addition price

- Some publishers may extend their access to the resources being subscribed for different period of time as per their policies after the expiry of the subscription or license period of using database on concessional basis. Taylor and Francis offers 50% concession/ on list price. Oxford journals collection is available individually or through package deal, back file access from 1849-1995
- Some publishers offer bundling of e-journals with the condition to buy all or none, some may also offer selective titles with higher price.
- Some allow interlibrary loan and sharing through e-mail or by other channels
- Some may deal with e-journals only, some may give offer for both e-journals and e-books together.
- Some offer access based upon annual subscription or perpetual access.

In the absence of standard pricing model, librarians have to negotiate with the publishers or the vendors to arrive at mutually agreed prices and the terms and conditions of accessing the resources. So far as evaluation of the package is concerned, trial and demonstration would be necessary to take the opinion of the users about the usefulness of the product.

Archival problem

Online resources are remotely located which often remain under the ownership of the publishers or vendors. Libraries have access to these resources under the terms and conditions of the agreement and licensing policy which poses serious problems at times especially after the expiry of the subscription. Even in case, library decides on outright purchase of the package which, of course, is quite expensive and unaffordable by most of the libraries, it creates archival problems. Archiving of back files is also not without problem. If the responsibility of archiving is assigned to the publisher, library shall have to pay maintenance and license charges for back issues. Decision has to be taken whether, archival responsibility would remain with the publishers or library will make its own arrangement. A onetime database development fees for permanent access rights to information in the archive can range from \$45,000 for a large institution to \$10,000 for small one, while annual access fee, to help cover the recurring costs of maintaining and up-grading the archive, ranges in price from \$5000 to \$20000¹³. Preference should be to archive back issues in local

server for certainty of all time availability. Timely care in its maintenance and migration from old platform to new one is important from time to time.

Management issues

E-resources are not visible to the users as in traditional libraries where resources are physically available for browsing and use. Libraries subscribe to the different packages of different publishers/vendors, as such information sources remain scattered which is not convenient to the users for browsing and searching. All such resources need to be integrated for access with a single stroke of key. Users neither have time nor patience for visiting number of locations of websites or platforms.

Present library software hardly have adequate provisions to handle e-resources except a few. Libraries are finding existing software incapable of handling e-resources. Some libraries have developed their own local system to fill up the gap. Availability of commercial ERMS is very few. It is difficult to evaluate and select the right system which can meet the local requirement of the libraries. Even then, e-resources in libraries mostly remain unorganized scattered on publishers' websites. Their management is so complex that it is difficult to find satisfactory solutions as required by the users as well as by library staff. There are multiple approaches of the users to access e-resources and ERMS is expected to satisfy all possible approaches of the users and also the requirements of the library staff in maintaining them. Users' approaches can be summarized as under which ERMS should be able to meet:

- Users prefer searching information material on a particular topic from all available sources
- Subject approach under a particular author may also be sought
- Search may be confined to a particular source or type of source (like journal articles, research papers published within a specified period), ignoring all other available sources
- Integrated federated search from printed as well as e-resources
- Selection and de-selection of records from the database for the purpose of download and printing
- Appearance of resources by title (A-Z) as well as grouping them under subject categories, searchable under general and specific categories.
- In addition to the approaches of the users, librarians have their own requirement of

providing computer generated services, usage, log and download statistics, compliance to terms and conditions of publishers, subscription expiry and renewal, compilation of common OPAC for all sources, migration of data from library software to ERMS.

In view of such complexities, libraries initiated developing their own software to provide solutions for management of these resources in the absence of commercially available EMRS. Jewell and Mitchell¹⁴ have discussed various ERMS of Cornell, Penn State University (ERLIC), Massachusetts Institute of Technology (VERA), University of California, Los Angeles (ERDb). Digital Library Foundation (DLF) and NISO have taken initiative to towards management of e-resources with the participation of professionals, individual libraries, vendors and consortia groups, etc. It has been organizing several seminars/meets and forming various groups/committees for the purpose of working out solutions for the management of e-resources. Its steering group developed and submitted a proposal to the Digital Library Federation with its primary goal to foster the rapid development of systems and tools for managing electronic resources – whether by individual libraries, consortia, or vendors, and specifically to:

- a. Describe the functions and architectures needed for systems to effectively manage large collections of licensed electronic resources
- b. Establish lists of appropriate supporting data elements and common definitions
- c. Write and publish experimental XML Schemas/DTDs for local testing
- d. Where possible, identify and promote appropriate best practices
- e. Where possible, identify and promote appropriate standards to support data interchange to work out solutions to the problems.

The outcome of these collective initiatives resulted in creation of ERMS.

Conclusion

E-resources represent many challenges at every level of their selection, acquisition, preservation, maintenance and management as discussed in preceding paragraphs. At the same time, these resources have also come with many advantages giving solutions to many professional problems like solution to space problem, providing remote access,

convenience in use, increased readership with improved services, leading to more opportunities for productive research output and academic excellence within shortest possible time. Recent studies have also proved that in researchers' opinion, improved access to e-journals has positively influenced their research activities by helping them to keep up-to-date and by saving time¹⁵. Use of e-resources is increasing leaps and bound as shown by many user surveys⁹. Many software have been developed and new projects are going on to provide better solutions to the existing problems. Technology has been behind the evolution and development of e-resources, and the same technology may be able to provide better solutions and more opportunities to have complete bibliographical control over world literature which is impossible in case of printed resources. What is required is synergy of professional skills and abilities with application of right technology so that e-resources are managed well for effective accessibility and use by majority of users globally. More cooperation and interaction are required among library professionals, publishers, vendors/aggregators, users and software engineers to discuss common issues to arrive at common goal of mutual interests to promote more production, use of these resources with their improved, maintenance and management to the maximum benefit of the users. It would be the joint efforts which may be able to provide better solutions to the problems. Future belongs to e-resources, their use would go on increasing with decline in use of printed material. It is being predicted that by 2020, more than 90% of the material would be in digital form. In such situation and future trend, library professionals shall have to cope up with new emerging digital environment and devise best possible techniques and methods of managing these resources efficiently and effectively for their improved availability and accessibility ensuring convenient and comfortable use overcoming all the barriers coming on the way.

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