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E-Resources and Services in Engineering College Libraries – A Case Study

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Introduction

Libraries have witnessed a great metamorphosis in recent years both in their collection development and in their service structure. Over the last several years, a significant transformation has been noticed in collection development policies and practices. Print medium is increasingly giving way to the electronic form of materials. This study examines libraries by region within the State of Karnataka, India. It examines the level of effort taken by the engineering college libraries in Karnataka to build electronic resources.

Ways of Electronic Collection from the Global

The availability of CD-ROM, DVD-ROM, and other online resources of bibliographical and full-text databases are quite common in the majority of the libraries under examination. Some of the important full-text digital collections available on CD-ROM include: ADONIS, IEEE/IEE Electronic Library (IEL), ABI/INFORM, UMI's Business Express and Library and General Periodicals, Espace Worlds, US Patents, etc. CD-ROM networking technology is now available for providing Web-based access to CD-ROM databases on the Local Area Network (LAN) as well as on the Wide Area Network (WAN). More evolved technology allows caching the contents of CD-ROMs on to a server. The libraries have an option to subscribe to these full-text databases as part of their digital resources. Most of the

important publishers now offer Web-based interfaces and full-text of their journals. Some of the major players in electronic full-text journal publishing include:

- Elsevier Science publishers (Science Direct): <http://www.sciencedirect.com/>
- Academic Press (Ideal Library): <http://www.idealibrary.com/>
- Springer Verlag (Link Electronic Service) : <http://link.springer.de/>
- American Chemical Society (ACS): <http://pubs.acs.org/>
- Wiley Interscience: <http://www.wiley.com/>
- American Physics Society (APS): <http://publish.aps.org/>
- Indian National Digital library in Science and Technology (INDEST): <http://www.library.iitb.ac.in/indest/>

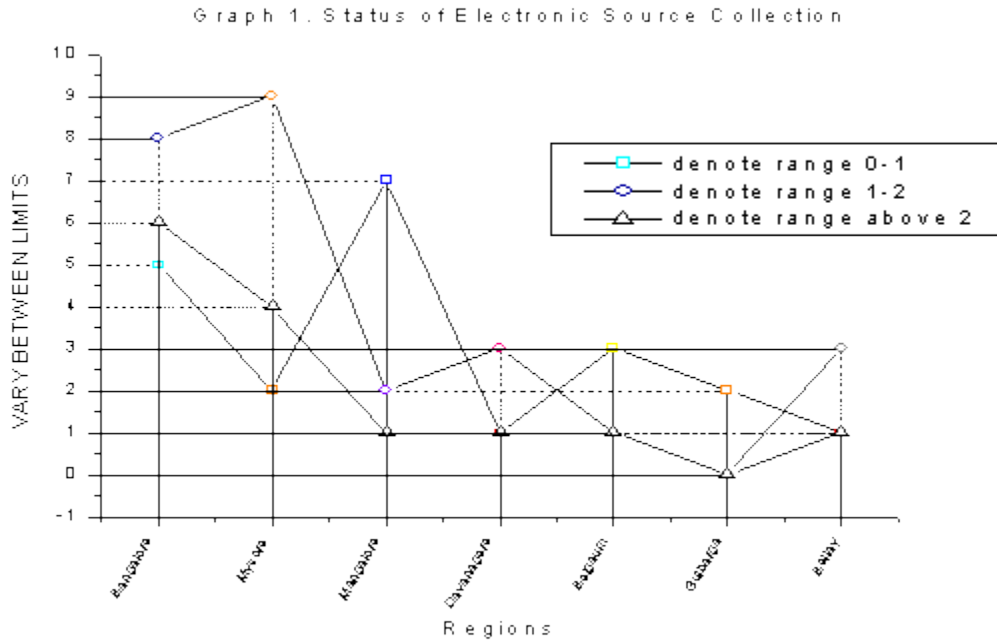
Moreover electronic journals, one of the cornerstones of the digital library, have grown steadily in number (APL, 1997). Besides electronic journals, there are several online databases that are now available through the Web including MEDLINE (several versions), AGRICOLA, and ERIC (all free). Reference works like encyclopedias, dictionaries, handbooks, atlases, etc. are also making their electronic appearance on the Web. Web of Science (<http://www.isinet.com/>) IEEE/IEE Electronic Library (<http://www.ieee.org/ieeexplore/>), Engineering Sciences Data Unit (<http://www.esdu.com>) are some of the important examples. Several digital library projects are concerned with providing digital access to materials that already exist within traditional libraries in printed media. Scanned page images are practically the only reasonable solutions for institutions, such as libraries, for converting existing paper collections without having access to the original data in formats convertible into HTML/SGML or in any other structured or unstructured text. There are four types of OCR technology that are prevailing in the market. These technologies are matrix matching, feature extraction, structural analysis and neural network.

The digitization of the library collections has given a new mission to librarians in terms of providing training to the users in the skills needed to discover access to in-house as well as remote materials, and in evaluating the retrieved information. In a digitized library, an engineering college librarian is required to be an active player--retrieving information from vendors, publishers, web sites, and other e-resources on the one hand; and processing and transmitting it to the users on the other hand. The information has to be transmitted to library staff by training and upgrading of skills.

Building of Electronic Resources in Libraries

Against this background, the present study makes an attempt to examine the level of efforts taken by the engineering college libraries in Karnataka in building electronic resources (Graph 1). Electronic collection includes CD-ROM, DVD-ROM, e-journals, audiocassettes, and videocassettes. Here the status of the collection infrastructure is

ranked into three categories: (i) Low (ranging between 0-1), (ii) Moderate (ranging between 1-2), and (iii) High (ranging above 2). Analysis of the status of electronic sources availability reveals that less than one fifth of the libraries possess high-level availability of electronic sources. The moderate level is identified among 42% of the libraries. The low level is identified among 34% of the libraries. The region-wide analysis indicates that the Bangalore region has high-level availability of electronic sources.

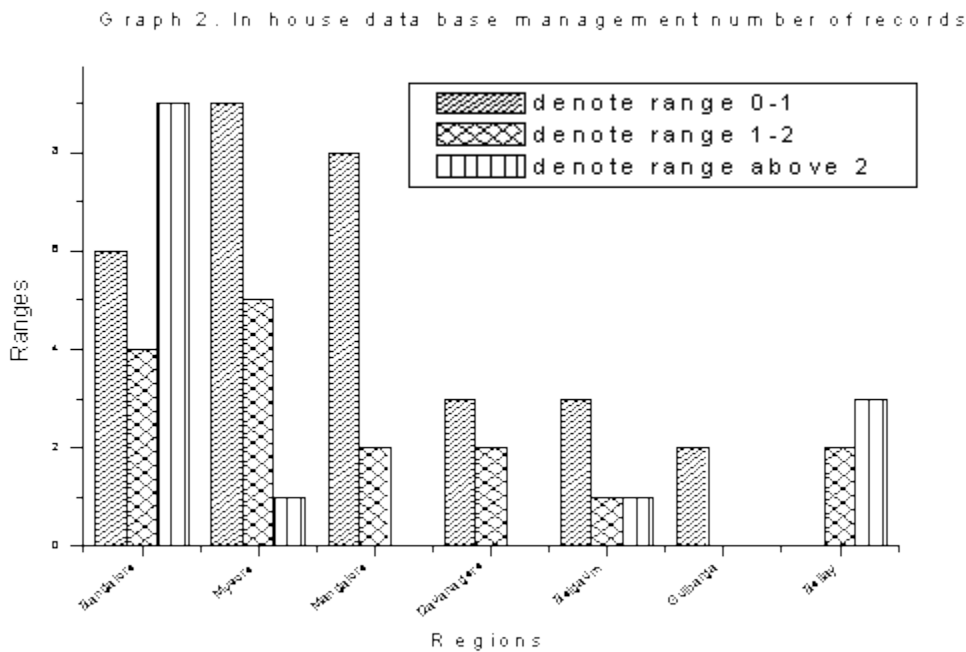


It is observed that only 14 out of 61 libraries (23%) have taken great care to build electronic resources (bibliographical and full-text databases) in various disciplines. A regional analysis has shown that about 10% of the libraries in the Bangalore and 7% in Mysore regions concentrate more on building the electronic resources, probably due to their availability of funds as well as the demand from their users. An analysis of the situation in the rest of the regions reveals that less than 2% of the libraries alone have focused their attention in building the electronic resources. It is quite unfortunate to note that while there is a great revolution in the world of electronic publishing, there is very little effort on the part of the sample libraries to keep track of the current trends. This is primarily due to (i) lack of awareness on the part of the academic community regarding the availability of the electronic resources in their concerned subjects, (ii) absence of library collection development committees having a complete inventory of authorized on-line resources, (iii) lack of demand from the users for electronic materials, and above all (iv) lack of access to the computers to make use of the electronic collections. This implies that a concrete effort needs to be taken to

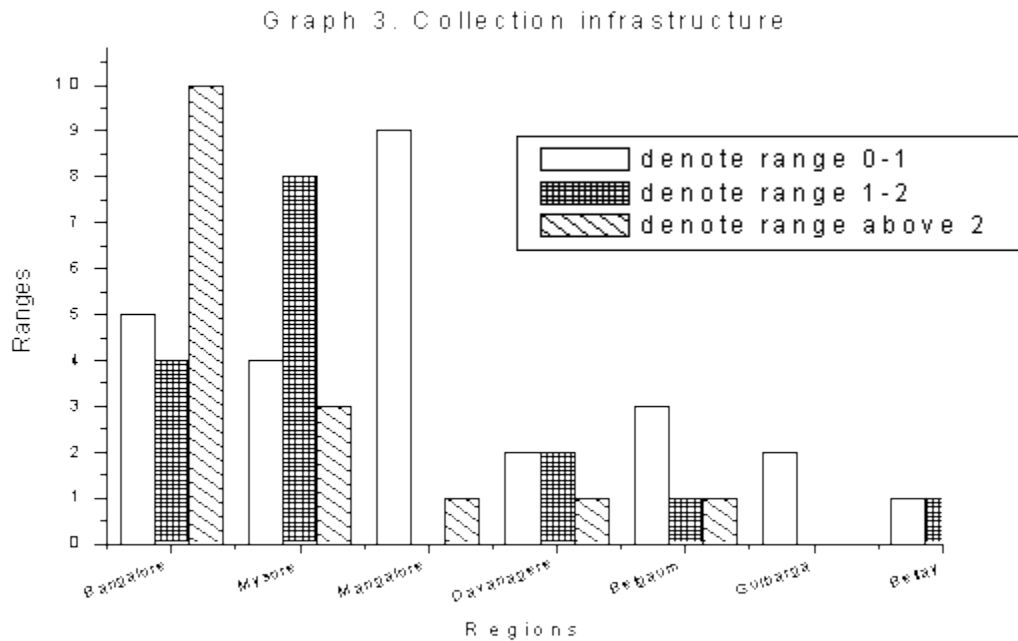
improve the computers as well as the amount of electronic resources in relevant subjects. The collection development policy of the individual institutions needs to be reformed in order to cope with the current trends and also to give wide access to the world's literature for the academic community. This would help to minimize the digital divide existing between the libraries with rich and poor collections. Besides this would help the libraries to participate in the expanding library consortium that facilitates resource sharing among the publishers, engineering college libraries, and the professional bodies.

Building of In-House Resources in the Sample Libraries

Graph 2 shows the status of in-house databases available in the sample regions. In-house databases include the compilation of bibliographic databases of books, journals, back volumes, theses and dissertations available in individual libraries. An analysis of the status of in-house databases (bibliographic databases) compiled by the sample libraries indicates that about 23% of the libraries have built a large database; 26% have built a moderate-sized database while more than 51% of the libraries have built a small database. A region-wise analysis shows that about 50% of the libraries in the Bangalore region have built a high volume of bibliographic records. In all other regions the quantity of bibliographic records compiled by the sample libraries is found to be at a moderate level. Graph 3 indicates the same result. An analysis of the overall electronic resources (both commercial and in-house resources) indicates that one-third of the libraries procure high-levels of electronic collections.



In the Bangalore region, the professional network as well as training programmes for the library professionals on database building is quite extensive compared to the other regions. The encouragement received both from within the institutions, as well as from the professional agencies outside the libraries, acts as a highly motivating factor for the library professionals in this region to take up this task with great interest. If such opportunities were extended to the library technical professionals in the other regions, the situation could be improved. Besides most of the training programmes are organized at the state headquarters (Bangalore) and this means that only the professionals within this region can take advantage of this facility. In the future, professional associations should come forward to extend their training programmes to outside the Bangalore regions. Moreover on-line tutorials and Web-based training programs could be initiated to allow the library professionals in the various regions to be trained in their area of activities.



Graph 3 shows the status of electronic collections and completed in-house databases available in the sample regions. Electronic collections includes CD-ROM, e-journals, audiocassettes, and videocassettes. In-house databases includes books, journals, back volumes, theses and dissertations. Here status of the collection infrastructure is ranked into three categories: (i) low (ranging between 0-1), (ii) moderate (ranging between 1-2), and (iii) high (ranging above 2).

The analysis of the overall collection, including electronic collections and in-house databases, shows just one third of the libraries procure high-levels of collection.

Among the sample regions, Bangalore region ranks in the top place with high-level infrastructure. The low level status is found among 42% of the libraries. The moderate status is found among 26% of the libraries.

Accesses and Service Infrastructure in the Sample Libraries

Information Retrieval

The Internet acts as a platform for sharing resources, which includes bibliographical and full-text databases, directories, journal tables of contents, reports, data archives, newsgroups, library catalogues, etc. An effective and efficient access mechanism that allows a user to browse, search, and navigate digital resources becomes necessary as electronic resources in a collection grow in number and complexity. The access methods for digital resources consist of Web OPACs, multi-Web OPACs for library catalogues, specialized collection Web sites for specialized image-based local collections, portals or subject gateways for Web resources, and search and browse interfaces for local collections. A typical digital library implementation may employ a variety of information retrieval techniques including metadata searching, full-text searching, and content searching or combination of two or more techniques.

Information retrieval is made more effective and user friendly by preprocessing digital documents to extract additional metadata before storage in a database. The database is then configured to generate indices from selected fields including authors, titles, abstracts, etc., and may also be configured to generate indices from the full-text article with a pre-defined stop wordlist.

OPAC

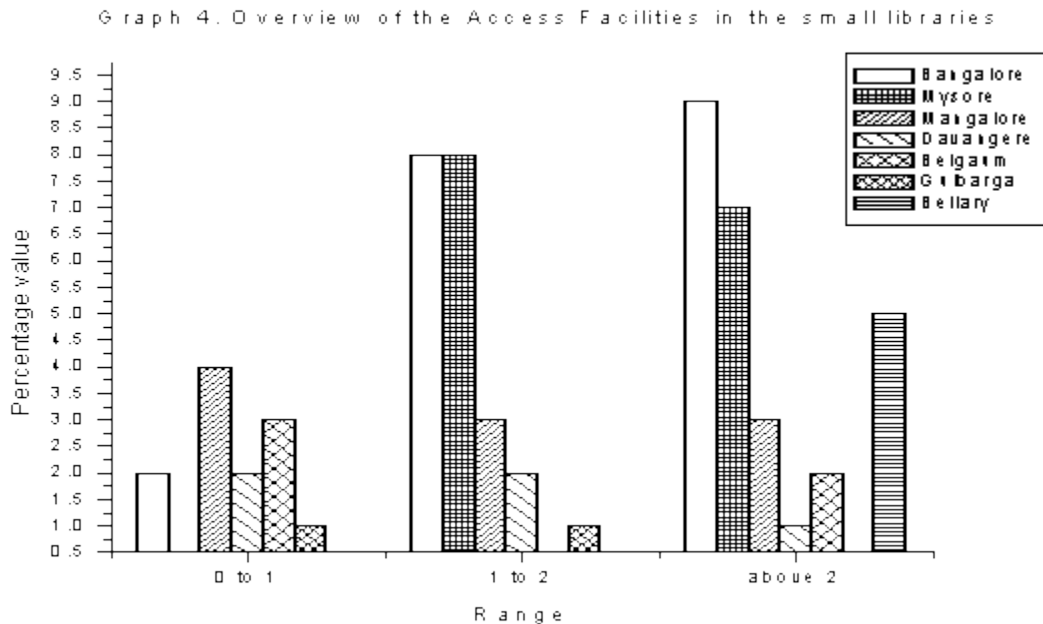
The OPAC is a database describing documents via bibliographic entries composed of fields, some which may be queried. It provides access to bibliographic records for the entire collection of books, back volumes, video, and film of the library. The OPAC can be searched in many ways as detailed below.

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

Portal of Knowledge Gateways

Subject gateways are an important component of a library website designed for the library users so as to help them discover high quality information on the Internet in a quick and effective way. Subject gateways can be defined as a facility that allows easier access to Web based resources in a defined area. The simplest types of subject gateways are sets of Web pages containing list of links to resources. Some gateways index their lists of links and provide a simple search facility. More advanced gateways offer a much-enhanced service via a system consisting of a resource database and various indexes, which can be searched or browsed through a Web based interface. The portal sites or subject gateways redirect a user to the site holding the original material.

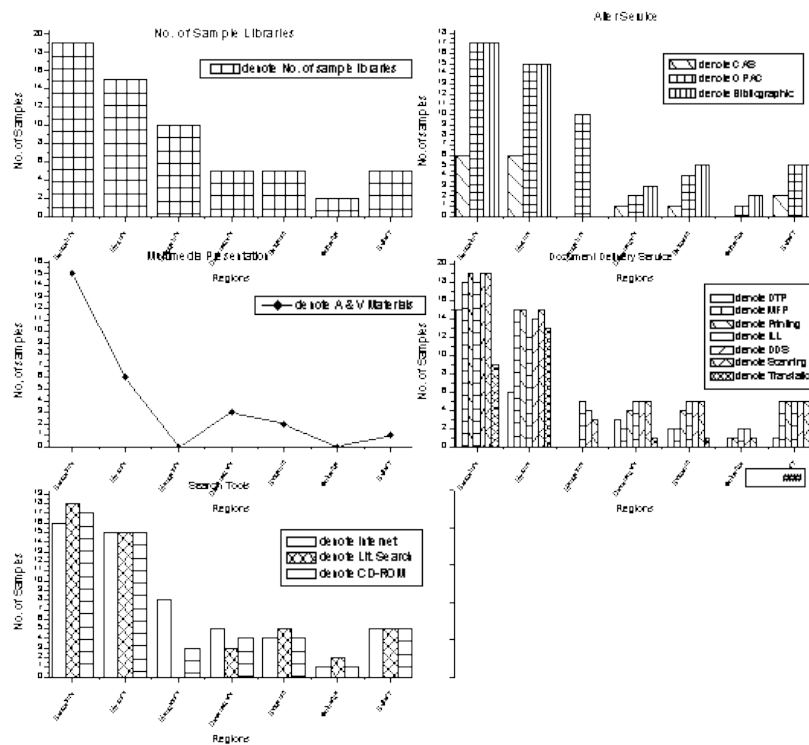
Evaluation of the Access Infrastructure in the Sample Libraries



Graph 4 shows the access infrastructure available in various libraries in the sample regions. The access infrastructure is classified into two broad headings, namely (i) access points (library catalogue, OPAC, subject gateways/portals, collections of special web site addresses, and web OPAC), (ii) reading materials for the users (hard copy, soft copy, and online). To graph the access facilities available in various libraries of the sample regions, the score value obtained is converted into index value. The index value obtained is categorized into three categories: low (ranging from 0 - 1), moderate (ranging between 1 - 2) and high (ranging above 2). About 44% of the

libraries have created an adequate level of access infrastructure. A region-wise analysis shows that in the Bangalore region 9 libraries have built high-level access facilities, in the Mysore region 7 libraries have established their access points to an appreciable level infrastructure, in the Mangalore region 3 libraries has built appreciable level of access infrastructure, 1 library has the high level in the Davangere region, 2 libraries have the high level in Belgaum region, and in the Bellary region 4 libraries has established adequate level of access infrastructure. From the table it is clear that, 36% of libraries are at the moderate level and 20% of libraries are at the low level of access. It can be observed from the above analysis that there is a sharp variation between the sample libraries with respect to the access infrastructure. The reason may be (i) lack of technological infrastructure, (ii) lack technical background of the library staff, and (iii) lack of regular financial funding.

Graph 5. Service Infrastructure



Information and Communication Technology Based Service Infrastructure in the Sample Libraries

The biggest technological event of the last two decades was the invasion of digital media in an entire range of everyday activities. Libraries also have stocked digital

audio/video images and multimedia documents. These digital data can be transmitted in a fast and inexpensive way through data communication networks. The digital libraries of today are network-based distributed systems, with individual servers responsible for maintaining local collections of digital documents. Electronic libraries help to expand access, increase usability and effectiveness, and establish new ways for the individuals to interact with information. In this context, the above graph 5 explains the status of the service infrastructure developed by the sample libraries in the sample regions.

The services are grouped into four categories: (i) alert services (content alert services, OPAC, bibliographic compilations), (ii) document delivery services (TDP, microfilm and microfiche reading and printing, printing services, JLL, document delivery services, document scanning and translation), (iii) search tools (Internet access, literature searching and CD-ROM searching), and (iv) multimedia presentations (audio and video viewing and presentations).

Graph 5 indicates that among the various “information alert services” analysed, the OPAC service seems to be common among the majority of the libraries in the sample regions. It is interesting to note that out of the 61 sample libraries, 54 libraries have provided OPAC service, though at different levels. For instance, nearly 50% of the libraries offer this service at the highest level while the others are at the medium level. It is encouraging to note that the sample libraries have not only initiated the process of compiling an OPAC but have also made it available for use to the academic community. This is one of the major effects that technology has had on the library. Next comes bibliographic compilation service, which is based on demand; about 26% of the libraries have undertaken this service. However, it is to be noted that the content awareness service, which was considered a prime service in the earlier days, has lost its importance with the introduction of the Internet-based services which facilitate users searching for information at their own pace. An analysis of the status of the document delivery services in the sample libraries indicates that (Graph 3) photocopying services (52%) have gained top priority among the users followed by circulation services (48%) and microfilming services (46%). Among the various services enumerated under this category, translation and interlibrary loan have received the least priority. The popularity for the photocopying service might be due to the non-availability of on-line journal subscription or e-books in most of the libraries. This has necessitated students and scholars to either borrow their relevant materials or to make a photocopy of them. As far as the search tools available in the sample libraries are concerned, most of the libraries have provided ample facilities for Internet and CD-ROM searching. Regarding the audio, video, etc. facilities are concerned, only a few libraries have their own labs to facilitate their students in using multimedia information.

Conclusion

The collection and service infrastructure of the libraries in the sample regions are not up to the mark. Engineering college libraries are struggling in building digital collection and disseminating digital information, due to the following factors:

1. Lack of ICT infrastructure,
2. Lack of IT trained manpower,
3. Lack of awareness of the digital resources,
4. Lack of user demand,
5. Lack of financial support,
6. Lack of access like computer facilities,
7. Lack of knowledge about the digital preservation methods,
8. Lack of training for the digital access, etc.

A concrete effort on the part of individual institutions with the support from the INFLIBNET would be a better alternative in designing on appropriate collection and service infrastructure. An establishment of ICT task force for individual institutions composed of IT experts and department heads would bring fruitful results.

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