CHAPTER – 2

REVIEW OF RELATED LITERATURE

The Review of earlier works done in the subject helps in increasing knowledge about the topic. In the following sections a review of the earlier studies conducted in the area of e-resources by various authors have been collected and presented.

Research is the process of raising a question and then trying to find an answer. It means a sort of investigation describing the fact that some problem is being investigated to shed for generalization.

The paper aims to provide details of a study conducted at Hunter College Libraries in 2005. The focus of the study was how the presentation of initial digital resource pages (or gateway pages) on the library's web site impacted students' subsequent steps in the research process. Results from the computer-based key tasks exercises were bifurcated. Completion rates for computer-based key task using the in-house developed Hunter College Library database grid, with less than 80 percent (37 percent-73 percent) students successfully completing all the tasks, was inferior compared to the performance using the Serial Solutions access page and the Academic Search Premier database, both commercially-developed products, with most of the tasks successfully completed by at least 80 percent of the students. [1]

This case study seeks to discuss the author's experience of providing e-journal services to the scientists at the Central Glass and Ceramic Research Institute – a centre of excellence in the field of glass and ceramics situated in Kolkata, India. It describes the developmental activities involved in providing user access to the e-journals and its impact on library operations. The author also shows that e-journals have added enormous resources to the collection and have improved the service of the library, enhanced access to journal literature, and decreased the demand for photocopy services as well as document delivery of single articles. [2]

The purpose of this paper is to report upon the design, implementation and findings of a research study by investigating the perceptions of electronic library resources within the UK to promote the education sector. While such resources are widely available to the sector, very little qualitative investigation has been done as to cast its impact upon teaching and learning and how it is viewed by those who have access to it. The findings of the research are entirely qualitative, and are reported through a sequence of annotated quotations, which reveal personal experiences and perceptions of using electronic library resources and the influence and impact they have had on teaching and learning activities. [3]

This article reviewed the library performance evaluations found in the literature of the UK, Germany, USA and Taiwan and constructed primary performance evaluation indicators. The Delphi Method was then used to summarize the opinions of the experts in completing the construction of a performance evaluation model for the e-library. With all the factors of e-library, user satisfaction and input of libraries as the basis, Analytic

Hierarchy Process is used to illustrate the problems and combine the two to establish the hierarchy structure for the performance evaluation of this research. The weights of all the indicators within hierarchies are calculated and then the weight of the overall hierarchies is worked out. The e-library plays two important roles: data searching and academic study. [4]

The paper seeks to provide some insight into the sharp increase in scientific publications originating from Turkish academic and research institutions in the last few years. The underlying reasons – widespread access to literature through electronic databases being the most important – are also investigated. The number of publications in electronic databases that index thousands of scientific journals can give some indication. Web of Science is one of these, and it is provided to the Turkish academic community along with several other databases by the national library consortium. Based on the Web of Science data, a comparative analysis was performed to investigate the publications originating from Turkey and other countries. [5]

This paper addresses another important organizational impact triggered by the migration of electronic journals that has received little attention in the literature: the changes in the library's operational costs associated with shifts in staffing, resources, materials, space and equipment. A common assumption is that converting library journals to digital format will ultimately improve the library service and lower costs, but this is yet to be proven. Understanding the total costs associated with the library model for delivering digital information has now become a requirement for library survival since in the digital world, as opposed to print, the library has many viable competitors. Our goal is to develop a framework for assessing the shifts in personnel and costs that can be used for

planning and budgeting at Drexel and provide guidance to other academic libraries which are not yet so far down this path.[6]

This paper focuses on data collection techniques representing the use of library networked electronic resources. It briefly notes some of the e-metrics initiatives of the Association of Research Libraries (ARL), and lists out the relevant standards for vendor supplied data. This paper argues that as libraries become increasingly less dependent upon vendor-supplied, subscription e-journals and full-text databases for access to scholarly information, so web-based surveys coupled with a networked infrastructure of assessment, such as suggested by the MINES for Libraries project, will become more important tools for evaluating the networked electronic resources. Web-based usage surveys are increasingly relevant to the collection of usage data to make collection development and service decisions, to document evidence of usage by certain patron populations, and to collect and analyze performance outputs. [7]

To determine whether Canada's university research capacity could be increased in quantity, breadth and depth of published scholarly information available to academic researchers, especially through the use of e-journals and cooperatively negotiated pricing and licensing of them. It also demonstrates that CNSLP has successfully found a new model for negotiating and licensing electronic information to expand the information available to the researchers. It is also identified that over 80 percent of the respondents believe that e-journal access had a significant impact on their ability to conduct research.[8]

This paper examines the pressures being exerted on university library budget structures by consortial license agreements and “Big Deal” arrangements. Particular

reference is made to the developments at three higher educational institutions located in the city of Glasgow, Scotland: the University of Strathclyde, Glasgow Caledonian University, and the University of Glasgow. Pricing in the electronic information environment is likely to remain a complex and a difficult area for the foreseeable future and academic library budgets will need to be sufficiently flexible in nature to be able to accommodate the complexities of current economic models. This flexibility is likely to require some degree of funding to remain under central control. [9]

Electronic journal packages, or bundles, have become standard resources in academic libraries in just the last few years. The impact on collections and budgets will be significant, but are largely yet unmeasured. A survey was designed to provide some data concerning the financial and collection implications of these bundles, and was distributed to the fourteen academic libraries within the Boston Library Consortium. Results are presented and discussed. [10]

This study assesses the ways in which citation searching of scholarly print journals is to back link searching of scholarly e-journal articles on the WWW, and identifies problems and issues related to conducting and interpreting such searches. Back link searches are defined here as searches for Web pages that link to a given URL. Back link searches were conducted on a sample of 39 scholarly electronic journals. Search results were processed to determine the number of back linking pages, total back links, and external back links made to the e-journals and to their articles. The results were compared to the findings of a citation study performed on the same e-journals in 1996. A content analysis of a sample of the files back linked to e-journal articles was also undertaken. The authors identified a number of reliability issues associated with the use

of “raw” search engine data to evaluate the impact of electronic journals and articles. No correlation was found between back link measures and ISI citation measures of e-journal impact, suggesting that the two measures may be assessing something quite different. Major differences were found between the types of entities that cite, and those that back link, e-journal articles, with scholarly works comprising a very small percentage of back linking files. [11]

With the exception of a few experimental projects, peer-reviewed electronic journals (e-journals) have been in existence for only about ten years. The purpose of this research was to study the effects of e-journals, at this early point in their lives, on the scholarly communities they are serving. The study addresses the question: To what extent are scholars and researchers aware of, influenced by, using, or building their own work on research published in e-journals? To put the question another way: What impact are e-journals having on the process of scholarship, research, and the advancement of knowledge? A sample of scholarly, peer-reviewed e-journals was drawn and techniques of citation analysis were used to conduct several analyses. The data shows, with a few possible exceptions, that the impact thus far of e-journals on scholarly communication has been minimal. [12]

This paper discusses the first findings of the empirical research project focusing on users' experiences of the virtual reference desk. The most central issues of the article deal with the user perceptions of reference transactions by using e-mail or chatting services and comparing those with perceptions about in-person transactions. The initial findings suggest that virtual reference service is not necessarily more successful than the traditional services received at the physical reference desk. This indicates the limitations

of computer-mediated communication; the results also imply many challenges for the development of virtual reference services so that they would be able to complement more effectively the traditional in-person transactions. [13]

The journal is fundamental to formal scholarly communication. This research report highlights the preliminary findings from an empirical study of scholarly electronic journals. The purpose of the research is to assess the impact of electronic journals (e-journals) on scholarly communication, by measuring the extent to which they are being cited in the literature, both print and electronic. The intent is to provide a snapshot of the impact of e-journals on scholarly communication at a given point in time, roughly at the end of 1995. This study provides one measure of that impact, specifically on the formal, as opposed to informal, communication process. The study also examines the forms in which scholars cite e-journals, the accuracy and completeness of citations to e-journals, and practical difficulties faced by the scholars and the researchers who wish to retrieve e-journals through the networks. [14]

The aim of the present survey is to study the use of the internet by the researchers at Punjab University, Chandigarh in all the three fields of knowledge—Science, Social Science and Humanities, so as to determine its impact on their academic routine. For this purpose, 200 questionnaires were distributed, 80 questions to the researchers in Science, 80 questions to the researchers in Social Science, and 40 questions to the researchers in Humanities. This was in proportion to the total number of researchers working in these fields. The results of the survey indicate that Internet has had a great impact on the academic environment. The researchers in the Sciences are making the maximum use of

the Internet facility provided by the University; however, the researchers in other fields still rely on bibliographies and printed journals. Researchers in Social Sciences and Humanities consider their institutional libraries as the last resort for obtaining information. Although academic resources are offered through online in their fields also, it may be that researchers have not been taught, or have not yet figured out, how to locate these resources. For this purpose, firstly the academic staff should encourage the use of electronic information sources for the research study. Secondly, the librarians should be provided with proper training in the use of online information sources. [15]

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 the development policies and practices. The print medium is increasingly giving way to the electronic form of materials. This study examines the 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. The collection and service infrastructure of the libraries in the sample regions are not up to the mark. Engineering college libraries are struggling to build digital collection and disseminate digital information, due to the following factors: lack of ICT infrastructure, lack of IT trained manpower, lack of awareness of the digital resources, lack of user demand, lack of financial support, lack of access like computer facilities, lack of knowledge about the digital preservation methods, lack of training for the digital access, etc. [16]

The Ontario Council of University Libraries (OCUL) launched the Scholars Portal in 2001. The Portal provides access to the networked electronic resources purchased consortially by twenty Ontario Universities. The assessment team at OCUL has partnered with the Association of Research Libraries Statistics and Measurement Program to use the innovative survey methodology: Measuring the Impact of Networked Electronic Services for Libraries (MINES for Libraries™) to assess the impact of the Scholars Portal on the academic community in sixteen Ontario libraries. MINES for Libraries™ are an online transaction-based survey that collects data for the purpose of use and demographics of electronic resource users. This paper describes the evolution of MINES for Libraries™ as a new survey method has been adapted from the earlier well-established approaches, discovers how the evaluation process unfolded with the OCUL implementation, and analyses the OCUL/MINES survey results. [17]

To ascertain whether the open access articles have a greater research impact than the articles not freely available, as measured by the citations in the ISI Web of Science database. The four disciplines represented a range of open access uptake: 17% of articles in Philosophy are open access, 29% in Political Science, 37% in Electrical and Electronic Engineering, and 69% in Mathematics. There is a significant difference in the mean citation rates for open access articles and non-open access articles in all four disciplines. The percentage difference in mean is 45% in Philosophy, 51% in Electrical and Electronic Engineering, 86% in Political Science, and 91% in Mathematics. Mathematics has the highest rate of open access availability of articles, but Political Science has the least difference in mean citation rates, suggesting there are other, discipline-specific factors apart from the rate of open access uptake affecting research impact. [18]

As a part of the 2006 Colorado Academic Library Impact Study, undergraduate students and the faculty from nine colleges and universities were asked to provide information about the services they used at their institution's library. They were also asked about their success in accessing the resources through their own library and other libraries.

- Computer access is utilized by the students far more than by the faculty.
- The use of interlibrary loan services is much more widespread among the faculty members than the students.
- Only slightly more than half of the surveyed faculties (52%) feel that they can usually find the print periodicals they need through their institution's library. [19]

A library's digital collection development objective is not far from its original mandate, i.e., to select, acquire, manage, preserve, and finally archive learning resource materials, which will support the academic, curricular and research needs of its parent institution. However, as far as the usage of digital resources over their print counterparts is concerned we have experience a paradigm shift. In most of our academic institutions and research centre, the user communities have access to digital information by using personal computers in their offices, libraries, computer centre. Unless the state-of-art strategies are adopted from time to time, the libraries will face the problems in many ways. This chapter explores the possibilities and strategies towards creating and operating a digital repository, a Central Digital Archive of the IIM Consortium Resources, in Internet compatible format, and making the contents accessible to all the IIM's via the

World Wide Web, on 24 x 7 x 365 basis. The archive is envisaged as a robust backup of the vast digital wealth of the IIM Consortium and a central repository playing the role of an intellectual network nerve centre. [20]

The economic development of a country depends heavily on its scientific strength and the ability to resolve the problems in such areas as public Health, Infectious Disease, Environmental Management, or Industrial Progress. Access to the research information traditionally depends on the ability to pay, which has a negative impact on developing countries. A number of new initiatives address this imbalance, ranging from consortial licensing and new publishing models to the Open Access Initiative, and have the ability to meet the needs of research in financially constrained countries. The advent of the Open Access strategies, particularly international institutional archives, has the potential to revolutionize the access to essential research. [21]

This paper examines the methodology and results from the Web-based surveys of more than 15,000 networked electronic services users in the United States between July 1998 and June 2003 at four academic health science libraries and two large main campus libraries serving a variety of disciplines. A statistically valid methodology for administering simultaneous Web-based and print-based surveys using the random moments sampling technique is discussed and implemented. Results from the Web-based surveys showed that there were approximately four remote networked electronic services users for each in-house user at four academic health science libraries. This ratio is even higher for faculty, staff, and research fellows at the academic health sciences libraries, where more than five remote users for each in-house user were recorded. At the two main

libraries, there are approximately 1.3 remote users for each in-house user of electronic information. Sponsored research (grant funded research) has accounted for approximately 32% of the networked electronic services activity at the health science libraries and 16% at the main campus libraries. Sponsored researchers at the health science libraries appeared to use networked electronic services most intensively from on-campus. The purpose of using the networked electronic resources by the patrons within the library is different from the purpose of using those resources by patrons from the remote place. The implications of these results on how the librarians reach decisions about the networked electronic resources and services are discussed. **[22]**

To examine the use of electronic information services (EIS) among the users of the Indian Institute of Technology (IIT) Library in Delhi, India, both questionnaires and observational methods were used for data collection where 300 valid samples were collected. The analysis of data collected covers the awareness of EIS services, use of e-journals, advanced search facilities, acquaintance with electronic information sources, the purpose of using e-information, problems faced by the users while using EIS, infrastructure facilities available and the satisfaction level of the users. It is found from the study that Boolean logic and truncation are the most often used search facilities by IIT users. Lack of printing facilities, terminals and trained staff are the major reasons that would discourage the users from accessing the EIS. The survey also reveals that some 60 per cent of the users face difficulties while browsing e-information. **[23]**

The present paper explains the research conducted into various aspects of the author's experience, attitudes and perceptions of publishing in paper and electronic

journals. A sample of 1,040 authors in a variety of disciplines was identified as having published a journal article in the preceding year. A questionnaire was distributed to those authors and 537 usable replies were received. The questionnaire was analysed in terms of author experience in the paper and electronic domains, authors' views on various aspects of electronic journals and their current skills. The results of the questionnaire suggest a small but increasing willingness to submit articles to electronic journals, and also suggest the continuing concern about the permanence of such media. Almost a third of the sample felt that the addition of multimedia to their articles would be beneficial but few had the necessary skills to produce and incorporate multimedia objects. It is concluded that the authors should be involved more in future research and debate in electronic serial publishing. **[24]**

The escalating price of the rapidly growing number of electronic journals, databases, indexes, and books, along with the traditionally published print subscriptions and monographs, will soon force the library administrators and collection development officers to make decisions between electronic or print products in the new millennium. The increasing costs of the dual format subscriptions or indexes are unfeasible and perhaps even unnecessary from the users' point of view in the disciplines of Political Science and Economics. The researcher compared the annual subscription prices and the percentage increases of the 203 core printed journals with their electronic counterparts in the disciplines of Political Science and Economics during the academic year 1998-2000. The complete list of electronically available titles were identified and priced, and then the titles costing greater than $500 were separated. The electronic usage of statistics was examined for the expensive serials, based upon the number of hits cumulated by the

users' requests via the Web sites of the Texas A&M University Libraries. After the pricing information and the usage of statistics for both electronic and printed resources were produced, the researcher had a clear answer for the electronic and paper dilemma. **[25]**

Outlines of the issues concerning electronic journals are found in higher education libraries. Reports on a research project at Liverpool John Moores University to investigate the reasons for any resistance to the purchase of electronic journals, given that the library/information profession has embraced a new technology. Comments on the findings from the first stage of the research (the UK situation), and details of the methodology for the second, third and the final stage (the North America situation) is in process now. The findings from the first stage including cost issues, the electronic environment, document delivery and archiving and identifying areas for further research has been discussed. **[26]**

Reflecting upon the short history and fast development of electronic journals, there is no doubt that electronic journals open up many exciting service opportunities for academic libraries. This technology possesses both advantages and disadvantages. Some advantages include multimedia capabilities, speed of production and distribution, and accessibility. Disadvantages are technological, socio-cultural, and economic barriers. As a literature review, this article begins with a brief historical background of electronic journals. It then delineates the positive and negative aspects of the technology and reviews the crucial issues and trends concerning electronic journals, which librarians need to be aware of and understand. Some practical implications that are unique to

academic libraries are also discussed. Although it is a relatively new territory, it is certain that librarians' analytical abilities and cooperative efforts to examine and balance the factors can make electronic journals a success in academic libraries. [27]

The introduction of electronic journals and electronic versions of journals have made serial collection management more complex. Libraries want to offer a particular journal both in print and electronic formats, which is often not financially feasible. More publishers are charging separately for the print or electronic versions or charging a higher price for both bundled together. As the budgets become tight, librarians have to choose between one format and another. In order to make the decision about what format to purchase, librarians need to know the format preferences of the users. To determine these preferences, library professionals can use several methods, such as user surveys, usage reports, and educated guessing. [28]

Sukovic discusses that the appearance of electronic text centres within the libraries during the past several years has been a significant development for both the library and research communities. At the same time, electronic texts have become a great challenge to the traditional roles in the library, research and publishing communities. Development of electronic textual resources mean dealing with the documents in new ways and in different levels, often involving work on a document's content through text encoding. This development challenges the library's assumed position in the research process. Discussing were done about why libraries should be involved in text encoding, particularly since text encoding affects information access and preservation, which are traditional library tasks. [29]

Cliff describes the application of Open Archives Initiative (OAI) techniques, via the OAI Metadata Harvesting Protocol at the Resource Discovery Network (RDN) for the development of Resource Finder, a search engine intended to provide a seamless search across all the gateway databases and present the mixed results from any subject area. Because Resource Finder merges all the results from all the databases. The distributed model significantly slows the response times. This is because any search is limited to the slowest database or network connection. In addition, Resource Finder has to wait for all the results from a given database (not, say, the first ten) and locally rank the complete set and there is a processing overhead. The RDN is a collaborative network of subject gateways, funded for the usage by UK Higher and Further Education by the Joint Information Systems Committee (JISC). Each subject gateway, as a part of its service, provides the end user with access to the databases of descriptions of freely available, high quality, World Wide Web resources. [30]

Berthon aimed to build a distributed and permanent collection of digital resources from the field of digital preservation. All resources incorporated in this 'safekeeping' project have been selected from the PADI (Preserving Access to Digital Information) subject gateway database (http://www.nla.gov.au/padi), whose initiative aims to provide mechanisms that will help to ensure that information in digital form is managed with appropriate consideration for preservation and future access. Its Web site is a subject gateway to the resources about digital preservation. Describing the first phase of this safekeeping project, being undertaken by the National Library of Australia, with

funding from CLIR (Council on Library and Information Resources). This project aims to identify the significant resources in digital preservation early in their lifecycle and also aims to facilitate the cooperative development of a distributed network of 'safe kept' material with resource owners, or parties nominated by them, providing long-term access to their material. It is anticipated that a diversity of technical and organizational solutions will be employed within this project that relies on cooperation within the digital preservation community, rather than on formal agreements, to realize an asset of communal value. It discusses some early findings and outcomes of the safekeeping project but recognizes that a full assessment of this approach must await evaluation over an extended period. **[31]**

Hart etc. describes the introduction of a Competency Based Progression (CBP) scheme by Staffordshire Library and Learning Resources Service (LLRS) to facilitate the staffing reorganization undertaken to ensure that the services remain viable in the dynamic world of both higher education and library and information services. It sets out the individual stages in the implementation of the CBP scheme, covering: the Steering Group; identification of competencies; framework structure; phases (development, target, achieving, outstanding); profiles; assessment; reward model; and evaluation. **[32]**

Gray and Abaid introduced a philosophical framework for cultural diversity in academic and public library collections followed by a practical approach to the collection development for library media collections. They investigated the issues related to identifying, evaluating and acquiring audiovisual resources that accurately portray the

people from a variety of racial and ethnic backgrounds. Practical information such as sources for selection, sources of reviews, promotion of multicultural collections, current awareness strategies for identifying the new resources, and listings of relevant catalogues and Web sites were discussed. [33]

Kenney etc. explained that the actuaries are concerned with calculating what benefits a company should offer, at what price, and for how long. Their job is to make sense of all the empirical and statistical evidence of age, gender, health, heredity, life styles, physical habits, and living and working conditions that serve as the indicators of longevity, productivity, and obligation. Archivists and the research librarians are interested in preserving the World Wide Web resources to face a similar challenge. Librarians increasingly depend on digital assets which they neither own nor manage. This research describes the current Web preservation efforts by the libraries and the archives and suggests how a new preservation strategy could use a risk management methodology. The approach taken by Cornell University's Project Prism (Main Project Prism (http://www.prism.cornell.edu/) and Library Project Prism (http://www.library.cornell.edu/preservation/prism.html) is to explore the technologies and tools designed to assess the lifestyle and habits of the Web that the research libraries and other entities can monitor and is useful to develop the retention policies for online resources. The approach begins with characterizing the nature of preservation risks in the Web environment, develops a risk management methodology for establishing a preservation monitoring and evaluation program and leads to the creation of management tools and policies for virtual remote control. The approach demonstrates how the Web

crawlers and other automated tools and utilities can be used to identify the risks; to implement appropriate and effective measures to prevent, mitigate, recover from damage and loss of Web-based assets; and to support post-event remediation. [34]

Norlin expresses that traditional reference services, where librarians gives the users the right or wrong answers to the questions, has slowly begun to change. With the emergence of electronic resources, digitalization, World Wide Web resources, and full text databases, many students need more of a consultation on where to get started than on which option is correct. Librarians at Arizona University Libraries strive to help the students to gain user sufficiency and information literacy. When on the reference desk, they tend to teach rather than do the work for the students. As the libraries are customer centered, it was decided to conduct an evaluation for its reference services. The evaluation involved using a combination of surveys, focus groups, and unobtrusive observation worksheets with a small sample of students. The results were very meaningful. [35]

Wilkinson describes that the electronic reference resources are becoming an increasingly greater part of reference publishing and reference collections. At present an interview-style joint discussion among several US academic librarians and publishers, who provide valuable insights into the current and future position of print and electronic reference materials and reference publishing. Topics covered include: the proportion of a reference collection in electronic format and the proportion of reference titles published in electronic format; the extent to which publishers are abandoning print versions of reference resources and the librarians' reactions to this trend; the impact on librarians and

publishers about the marketing of electronic resources that have as their core existing print resources along with the expanded or updated materials and links; and the importance of the usage of statistics for electronic resources. [36]

Block traces the long history of the usage of remote, off-site storage for library materials. Despite the changes in the kinds of information and materials that are stored and the technologies that enable their storage, the relationship between a reader's time and the distance of material from the reader is a constant challenge to information providers. It is concluded that the competing visions of service and economics, to which remote storage is one response, are timeless. [37]

Block compares the coverage of electronic databases not usually searched by educating the students and the faculties which may be more useful for comprehensive retrieval in the discipline of higher education. These databases were analysed and compared in terms of their usefulness for educational research using 3 topics of current interest in the field: affirmative action; tenure; and school to work. The Education Resources Information Center (ERIC) served as a benchmark database against which the results from other databases were compared and was itself examined to see how effectively it covered the 3 topics. [38]

Phelps suggests that building 'permissive, but robust' digital libraries and services is an attractive alternative to the library and computer science tradition of building 'strict, but fragile' systems. Strict, but fragile, systems are efforts to the engineer to complete the systems that ensure the desired properties, but which often prove impractical in the

distributed environments without a central authority to co-ordinate change. The permissive, but robust, approach, permits the individual components to change in ways that might cause a desired property to fail to persist. It describes the application of the permissive, but robust, approach to two related problems of reference in the distributed information systems. The first application yields robust hyperlinks and the second, robust locations. Robust hyperlinks address the familiar issue of providing persistent reference to the networked resources, such as Web pages, given changing, unco-operating services. Robust locations concern references to the changing subdocument resources. (Original abstract - amended). [39]

Clyde discusses that the article included in a special issue devoted to the theme: Library automation: moving into the next generation. It starts from the assumption that all school libraries should be computerized and considers the contribution that computers could make to the school library: as an administrative tool; as a resource for teaching information skills; and as a part of the library collection in the form of software and databases on disc. It is concluded that if school libraries are automated for the right reasons, to provide better access to the information resources and to provide a tool for the teaching of information searching skills through the online public access catalogue (OPAC), then a case can be made for every school library to be automated. [40]

Royan, B. Scran describes the Scottish Cultural Resources Access Network (SCRAN) (http://www.scran.ac.uk), a 15 million pound project to build a networked multimedia full text database for the study and celebration of human history and material culture, drawn largely from the libraries, museums, archives and built heritage of

Scotland. SCRAN currently provides access to 80,000 images, sound and film clips and virtual reality objects, and this total is expected to rise to 120,000 by August 2001. It pays particular attention to the methods of information searching and retrieval. [41]

Weimer etc. express mostly about the computer programming manuals or materials about the Internet. The increasing publication and acquisition of books accompanying CD-ROMs, it was felt necessary to review the libraries' policy of separating CD-ROMs from their books and securing them behind a service desk. It was believed that CD-ROMs shelved in the open stacks with their books would circulate more than when the CD-ROMs were housed separately. Further it was believed that the books and their accompanying CD-ROMS, if lost or stolen, would be easily replaced. Data were gathered about the circulation rates of these materials when they were separated, the loss of rates in the open stacks when they were shelved together and the availability of replacements. Based upon the data gathered as well as other considerations, it was recommended that for items accompanying CD-ROMs, the CD-ROM should be kept with in the book, with no additional security beyond the book's sensitized stripe. [42]

Evans and Brickley describe the origin and the development of the Bristol Biomedical Image Archive (http://www.brisbio.ac.uk) the World Wide Web based service at the Institute for Learning and Research Technology (ILRT), Bristol University, UK, consisting of a growing collection of 8500 images in the medical, dental and veterinary fields, donated by the academics worldwide and freely available following registration. It describes the online cataloguing of the digitized images using metadata, Medical Subject Headings (MeSH), the National Library of Medicine's Unified Medical Language Scheme and the Dublin Core Metadata Element Set. Other aspects covered

include: image checking; technical development; security and electronic teaching resources. [43]

Brancolini discusses the collection development in an electronic environment. One of the most important challenges faced by the digital library planners is the selection of research collections for digitisation. The costs associated with creating digital resources are significant. Planners must develop the selection criteria and procedures in order to ensure that limited time and resources are committed to the projects to digitise the most significant collections with the highest probability of successful completion. Librarians at many academic libraries have developed the selection criteria for the creation of digital collections. These criteria consider many of the same factors that go into the decision to license or purchase information resources. However, there are additional considerations. Librarians at Harvard University have written the most comprehensive guide to the selecting research collections for digitisation. In this article, the author applies the Harvard Model to a digitisation project at Indiana University in order to evaluate the appropriateness of the model for the usage at another institution and to adapt the model to local needs. [44]

Sharma describes that Information technology (IT) involves computers, electronic media, and satellite, telecommunications and storage devices. It has made a deep impact on the academic libraries. The emphasis of these libraries is shifting from collection to access. Academic libraries in India still face several challenges due to the emergency of IT. It lists all the challenges and deals in detail about one of the foremost challenges, i.e. manpower development in the context of IT. It discusses the provision of raising the facilities on IT in the library schools, inclusion in curriculum, short term

training facilities by other organisations, refresher courses, participation in workshops, seminars, conferences, conventions etc. For their own survival and for the survival of the profession, the librarians have to play their role effectively in future; otherwise they will be replaced by a new group of professionals. [45]

MacArthur discusses many librarians, especially those in technical services; seem reluctant to accept Web-based opacs, or webpacs. However, libraries are facing the real competition from the Internet information supplied by other organizations and it is important that they begin offering Web-based opacs as soon as possible in order to keep their credibility as information providers. It suggests the categories of materials that should be prioritized for inclusion in Web-based opacs and provides a list of helpful Web resources for cataloguing the electronic resources. [46]

Davis and Stone tell explain the decision to install Web Cat to integrate the electronic journals into the print collection, provide hypertext links to journal home pages from within the catalogue record and offer catalogue access across 5 sites. It describes the Web Cat functionality, linking to the Internet based resources and the feasibility of using Z39.50 for integrating catalogue access. [47]

Hinchcliffe explains the following: combining traditional and distance education delivery methods; evaluating Web-based courseware; affect and impression management; and faculty training. Reports of the following topics and programmes: teaching information literacy skills in online courses; converting training methods to a dynamic learning environment; learning in the digital age; distance education quality standards; the library's role in distance learning support services; and electronic library resources and instructions [48]

Cuendet covers the national consortium for electronic information in research and education Bib link (workshop on the Swiss Internet clearinghouse for information specialists, which provides links facilitating research); reference services and the new media (workshop on electronic reference services in relation to skills and training requirements for librarians); analog and digital supports (presentation on the range of supports now available, with emphasis on the Internet); and digitisation of sound archives at Radio Swiss Romande (identifying priority material for conversion, both current and retrospective). [49]

Calhoun reviews which are published in Choice are known to influence book selection, particularly for academic library collections. It reports the results of an investigation to determine how many books, which were reviewed over a 7 year period in Choice Reviews (the CD-ROM database version of Choice), were subsequently received or purchased by the Cain Library, California State University at Dominguez Hills, as well as by a large number of other libraries across the USA. Check list of the online public access catalogues (OPACs) in the libraries revealed that all of the books mentioned in Choice Reviews were purchased by (1) or more libraries, while the majority of the books were purchased by several hundred libraries. The findings were further tested to determine the extent to which they could be incorporated into an academic approval programme. (2) Notification slip approval plans were created for new titles from the presses and publishers of the best received books. Notification slip titles were searched shortly after they appeared or were profiled by the vendors and a correlation was found between the later review holdings and these early approval holdings. [50]

Yu discusses the electronic resources and their use in libraries, from the viewpoint of reference services, with an emphasis on the Internet and Geographic Information Systems (GIS). It discusses the concept and functions of GIS and compares the use of GIS in libraries with library map collections. It reviews GIS projects in libraries and examines GIS user services and the challenge they pose. It discusses the user access to GIS and argues that simplified and varied user interfaces are important to improve user access. [51]

Sklar defines a licence and outlines the difference between licensing and copyright. It looks at the issues for consideration while entering into a licensing or other agreement with a vendor of electronic resources. These are: defining use and users; monitoring use and maintaining security and privacy; and the question of warranties. It outlines the procedures to be followed while purchasing the electronic resources. [52]

Wilson expresses that the Documents Center Web site, created at the Michigan University Graduate Library's Documents Center is designed to fill 2 major missions: to serve as a reference tool for answering in person, telephone, and e-mail questions, relating to US government and international organization publications, asked about the Documents Center staff; and as a bibliographic instruction platform for teaching library research skills to graduate and undergraduate students. The Web site has dramatically changed the information delivery at the Documents Center, suggesting the need for new statistical measurement standards, a reallocation of staff time, and active library marketing strategies. [53]

Walters discusses that the internet resources have grown in number and importance, public and private organizations have begun to develop World Wide Web based aggregations of periodicals, conference reports and data files. The best aggregations of Web resources combine the authoritative information, effective retrieval mechanisms and dependability of access. The worst can be incomplete, inaccurate and difficult to use. Libraries can expand their Web holdings and maintain high quality information services by selecting aggregations based on objective standards of content, coherence and functionality. It describes the work of the Albert R. Mann Library, Cornell University and concludes that these 3 criteria's can also be used to plan the most effective presentation of aggregated resources in the library catalogue or Web site. **[54]**

Academic Libraries have the outlines of the background to the preparation by the Media Resources Committee of the Association of College and Research Libraries in the USA of draft guidelines for media resources. The guidelines are set out under the following headings: objectives; organization/administration; staff; budget; user services; collections; facilities; and bibliographic access and cataloguing. **[55]**

Lee analyses the results of a survey undertaken with the joint support of the Readex Corporation and the Government Documents Round Table of the American Library Association. The survey was administered to foreign documents libraries at 132 research libraries in the USA and Canada to determine the current collecting practices and policies among those libraries with strong foreign documents collections. Trends

identified include: continuing reliance on print format with a slowly increasing use of electronic resources; and integration of foreign documents into the general collection management policies of research library collections. [56]

Norman analyses the results of a study, involving a questionnaire survey and visits to 15 academic libraries in Canada and the US, of collection development practices. Includes: the impact on the materials budget, collection development policies and licenses; identification, evaluation, selection and development of the collection; training subject specialists in the use of electronic information resources; and the changing role of collection development librarians. [57]

Bakker explains that online communication systems have extended the scope of today's research libraries beyond the boundaries of their own collections. For efficient collection management it is essential to know how far the collections meet the users' needs. In the Netherlands consideration must be given to the creation of a national repository for electronic resources. Libraries will increasingly be forced to reduce the expenditure on printed materials to free funds for electronic resources. The creation of a comprehensive network of research collections offers scope for a range of cooperative projects. [58]

Dupuis discusses that technological changes that are occurring rapidly and the students entering colleges are bringing very disparate computer skills and attitudes. Some students are reluctant to embrace new technologies; others demand electronic resources

for all assignments. By considering the computer access and Internet resources available to the elementary school students today, it is possible to imagine what a user will expect from the libraries tomorrow. Although college students may arrive at libraries with increased computer skills, their knowledge of electronic information may be lacking. It defines the information literacy with an overview of information literacy skills. The Digital Information Literacy programme at Texas University at Austin serves as a case study for integrating information literacy skills into traditional services and partnerships. **[59]**

Rees considers the legal aspects of electronic information access in the context of Plymouth College of Further Education, Library and Learning Resources Service, UK. It covers the licensing of purchases and how they are used and for what purposes, health and safety, access to information (particularly Internet use), copyright and plagiarism and the use of electronic mail. **[60]**

Davidsen describes the design and construction of the Web site: Michigan Electronic Library (MEL); the world's largest evaluated and organized World Wide Web based library of Internet resources with over 18000 links in 14 different subject areas. Produced by Michigan University, MEL has 3 goals: to provide a library with electronic information resources, selected by the librarians, with a focus on local, state and federal government information; to provide free access via existing telecommunications networks to as many Michigan libraries and residents as possible; and to provide a backbone of electronic information resources which will allow Michigan's libraries to

focus on developing and contributing local electronic community information resources. (The Michigan Electronic Library Home page is at URL (http://mel.lib.mi.us). [61]

Sung describes the work of the National Central Library, Taiwan, in developing its Remote Electronic Access / Delivery service of the National Central Library (READncl). READncl results from several years' work in the electronic storage of the library's substantial collection of academic periodicals, government publications and literary and historical materials. READncl features 9 systems with over 1 million entries, 3 million pages of text images on CD-ROMs, 246 full text hyperlinked periodicals and links to the Web sites and electronic mail addresses of 160 publishers, 142 government agencies and 50 libraries. For the future stage, it is planned to encourage the collaborative efforts between the librarianship and the publishing professions to establish the digital databases by providing the digitized learning resources. [62]

Toszegi expresses that the Hungarian national union catalogue of foreign journals was separated from the union catalogue of books in 1970. Computerized processing was started in 1982. Due to the lack of financial resources and other limitations imposed upon the libraries, the number of reporting institutions have dwindled to half the previous number; however, the number of records have been increased. The database has been available for online searching since 1988, and the CD-ROM version of the database is also very popular; it is also available in the Internet. Issues to be addressed in the future include retrospective processing of periodicals and registration of electronic periodicals. Original abstract – amended. [63]

Sievers describes the experience of planning, building and organizing the library services in the new Kelvin Smith Library on the campus of Case Western Reserve University in Cleveland, Ohio. The library was planned and designed to be a 'virtual library' and relies heavily on supply of information through the electronic resources as well as through the traditional means. Outlines the library's serial-based 'shared digital library' model which is based on the proven success of cooperative bibliographic database efforts such as OCLC and RLIN, and involves the creation of bodies of digital documents by undertaking a digital retrospective conversion full-text. It discusses the options of doing serials in the new virtual library, covering choice of format and supply vehicle, and of acquisitions methods. **[64]**

McKiernan expresses that while there are many information sources available in the World Wide Web, the identification of significant Internet resources is often not as efficient nor as effective as many would desire. In 1995, a demonstration prototype service, Cyber Stacks (http://www.public.iastate.edu/~CYBERSTACKS/) was established at Iowa State University to enhance the access and the usage of the selected Internet resources in science, technology and related areas through the application of the Library of Congress Classification Scheme as an organizational framework. It reviews the creation of Cyber Stacks and the methods and techniques for facilitating access to the World Wide Web resources. **[65]**

Gomez presents a survey of the situation of science and technology libraries in Argentine Universities with respect to their capabilities for accessing the electronic information. The state of libraries across the country is uneven, ranging from the libraries with adequate information technology, and consequent access to the services like electronic full text databases or electronic transmission of documents, to those which have only just started input into their first bibliographic databases. It focuses on the developments which are leading to substantial improvement in access to information access, and also on the foundations of this development phase. The latter includes: QUIF programme (Quality Improvement of Universities Fund); University Interconnection Network Project (UIN) (which connects state universities with each other and with the rest of the world); and the science and technology Information workgroup working within MERCOSUR, whose aim is the regional integration in the information area as well as the optimal use of the available resources. **[66]**

T Gomez describes the purchasing power of academic libraries in the Netherlands which has declined sharply. In this critical situation the most obvious solution seems to be resource sharing. The electronic infrastructure by which this can be achieved is well organized in the Netherlands, but the availability of documents and resources is becoming a problem. The situation is further complicated by the growing importance of information resources in new formats which competes for limited funds. Coordinated collection building aims to broaden the coverage of research holdings by cutting costs through minimizing any unnecessary overlap of specialist research publications. However, the collections are still being increasingly restricted only to essential work, so

the possibilities for exchange appear to be compromised, despite the efficiency of the inter-library loan network. Librarians have to become information specialists to help the end user with both printed and electronic resources. [67]

Ani's describing of the results of the survey show that only six university libraries are fully "computerized", nine are "about to be computerized"; seven of the surveyed libraries have been installed local area networks, five have online public access catalogue and only four libraries provide internet service. The major obstacles that influence the effective adoption of ICT in university libraries are inadequate funds and the poor state of electricity in Nigeria. [68]

Gulati in his paper discusses the status of information and communication technologies usage in Indian libraries with special reference to special libraries and the efforts made by the various institutions to propagate e-information products and services. This paper highlights the consortia efforts in India at NISCAIR, New Delhi, IITM, Kerala, C-DAC Pune, and the Digital Library of India. In addition, it incorporates the details on major information systems in India (such as NISSAT) and the major library networks in India (such as INFLIBNET, DELNET, CALIBNET etc.). The paper concludes with challenges for library and information science professionals and an overview of initiatives taken by the Government of India. [69]

Samuel analysis of the data showed that, on a self-assessment basis, out of about 268 professional librarians, only 87 (approximately 32 percent) were ICT-literate, implying that the remaining 181 (approximately 68 per- cent) professional librarians were ICT-illiterate. Out of 358 paraprofessionals in those libraries, only 28 (approximately 8 percent) were ICT-literate, while the vast majority, some 330 (approximately 92 percent), were ICT-illiterate. Out of 1,133 "other" staff members in the survey, a minimal 69 (6 percent) staff were ICT-literate, while 1,064 (approximately 94 percent) were ICT-illiterate. [70]

Patricia A describes that time is very essential for the librarians to review the pace of change occurring within higher education and how information will be provided in academic libraries to their vastly changing student population. The integration of technology in higher education has an impact on academic libraries in two direct ways: changing material formats and the scholarly communication options; and changing how information is delivered, beyond the classroom experience. The authors examine the depth of the format change issues, including changes in data preservation and conversion, personnel and facilities issues, and a close examination of scholarly communication and distance education issues facing by our higher education and academic libraries. [71]

Peter Stubley reports on the Multimedia in the Libraries Project, which was begun in October 1990, to investigate the specific opportunities that technology offers to the libraries and information centres. It discusses the four multimedia modules included in the prototype covering non-verbal communication, query negotiation, bibliographic search strategies and the feedback of information to the enquirer. It concludes that the

evaluators have appreciated the creative and tongue-in-cheek use of multiple media in this important area. [72]

Maria Laura Bargellini and Luciana Bordoni show that distance learning can be defined, in the most general terms, as a method of education that involves an instructor and student(s), who are separated geographically and must rely on one or more methods of long-distance communication. It is the direct descendant of correspondence and home study courses that were developed in the nineteenth century. What is new, however, is the wealth of telecommunications and telemetries options available today that enables the provision of this high-tech educational environment and the enlargement of the potential user base. Libraries have a central role in education, learning, and vocational training in support of increasing knowledge. The rapid evolution of information and communication technology in the learning field imposes supports and stimulates the re-engineering of the library. This paper provides a description of a new distance learning scenario in a library service. [73]

Philip Barker, In the context of information storage and sharing new electronic technology has much to offer conventional library systems. A video disc can be a valuable storage component. However, its full potential is unlikely to be realised if it is used in isolation from other equipment. Computers, communication networks and video discs can together provide many novel information storage and dissemination systems for using in the libraries. This paper describes some of these and also gives a brief outline of some approaches for providing all the important user interface to such systems. [74]

R.P Kumar describes that Indian civilizations is one of the oldest civilizations with a kaleidoscopic variety and rich cultural heritage. It has achieved multi-faceted socio-economic progress during the last 43 years of its independence. As the seventh largest country in the world, India is well marked off from the rest of Asia by the mountains and the sea, which gives the country a distinct geographical entity. India comprises twenty five states and seven union territories. India has made commendable progress in the technological, engineering and communication fields. Modern technologies are applied to information handling. Production of hardware and software technology is domestic. National resources are augmented by establishing links with the international systems. There are 106 medical colleges, and 40 dental colleges in India. Besides this, there are nursing colleges, pharmacy colleges and other institutions. Each college/institution has a library of its own attached to it. The libraries can be classified into Medical, Research, Ayurvedic, Homeopathic, Dental, Unani and Pharmaceutical Libraries. A survey was carried out on the usage of modern technologies in health science libraries. For example, Photocopiers, microfilming, computers, facsimile transmission, audiovisual, online searching and CD-ROM in the form of a questionnaire. Personal visits were made to a number of libraries and some of the librarians were also interviewed. This paper examines the impact of modern technologies on medical libraries, and concludes with the problems faced by the librarians in adopting the modern technologies and suggests the need and measures for implementation of modern technologies to health science libraries. **[75]**

Frances Schofield expresses that the people's network (PN) aims to ensure the provision of free and open access to Information Communication Technologies (ICTs) through public libraries. This paper compares the usage of a PN converted library to an original learning centre. It was found that a wide range of people from different age groups and backgrounds use the ICT facilities. The results also indicated that both the libraries had been successful in providing access to ICTs for people who would otherwise have had no access, although the age of the technology available in the established learning centre had a negative impact on users, and the take-up of online learning opportunities had not been as prominent as would be expected. [76]

Olayinka Catherine Fatoki describes that the GSM technologies acceptance and growth rate among the Nigerian populace has serious and great potentials for enhancing the communication and information technology-related services in libraries and information centers in Nigeria. However, information managers need to fully exploit the opportunities presented by this relatively new phenomenon with a view to providing improved products and services to the library users, especially in the academic sector. [77]

Damaris Odero-Musakali expresses that the potential advantages of the internet appear to have precluded the foresight of Kenyan university libraries to the challenges that may be associated with its deployment. There is a clear under-utilization and considerable disparities between and within the libraries in their levels of general Information and Communication Technology (ICT) deployment and the usage in Kenya. Most of the public university libraries are still using the conventional methods of service provision, suggesting that most of the library employees are not ready to embrace and

integrate these information technologies in their routine operations. ICT applications cannot be widely deployed, and then the benefits resulting from such technologies are likely to be equally curtailed. [78]

Sarah Ormes considers that this paper explores some of the issues surrounding the development of Internet services in public library children's services. It shows that IT services have generally been undeveloped in children's libraries and that this trend must not continue with networked computer services. This paper reveals the fact that the lack of net-worked computer service provision in children's libraries may lead to them to remain ‘irrelevant’ and ‘old fashioned’ to their users. The paper focuses on literature and literacy issues in relation to information and communication technology (ICT). It shows that few libraries have been using ICT to support their literature-based services. One possible service model for the integration of ICT into literature services, UKOLN's Treasure Island Web site, is described and the results of an evaluation of it has been interpreted. The paper is concluded by looking forward to the Stories from the Web project which will develop the Treasure Island model further. [79]

Nancy K. Herther’s purpose of this article is to advocate a broader discussion of potential needs for better communication and theory in the areas of technological adoption, management and application in libraries and information centres. From the personal readings, reflection, experience and the insights of others in the field, the paper considers the movements in the larger library and information science (LIS) theoretical literature and its potential application to technology issues. Numerous areas of potential future research and action in the field are identified to stimulate further discussion and

efforts. Although these newer theoretical discussions have stimulated research and reflection in the few, few discussions have been made in the information technology arena, an area ripe for such consideration [80]

Padmini Srinivasan, understood that knowledge management is extremely important in order to achieve the goals and aspirations of research communities. Traditional knowledge management methods linking different knowledge resources are now being augmented by newer models and methods that have excellent potential benefits. The new innovations typically involve creative combinations of technology, human expertise and communication models. Innovations such as digital libraries have attracted significant attention, especially in the publishing industry. Some of these projects have made the transition from prototypes to production systems, enabling relatively quick and reliable access to research publications. Other innovations such as "Push Technology" or information filtering promise a level of maturity that could offer researchers a constellation of automatic electronic agents that assist with highly specialized aspects of the research process. This paper examines the developments in some of these innovations and their potential for researchers. [81]

Sandra Sharp expresses that The library services have developed a learning plan by offering different levels of access to information and communication technologies to give the opportunities to all and are trying to expand on provision to learning and information technology to vulnerable and hard to reach the groups. [82]

Rachel Spacey's consideration of the implications of technological change for public library staff and managers in the UK is based on the selected results of a literature review. Recent developments affecting the growth of information and communication technology (ICT) in public libraries provide a context against which research into the effects of automation, the introduction of ICT in a variety of library environments and into society generally, are explored. The values of attitudes to ICT are questioned noting that attitudes are often seen as being important in determining the successful implementation of ICT in libraries. Training is suggested as an appropriate means of enabling staff to cope up effectively with technological change. Successful training is needed to appreciate that staff have different needs and so prefer different training methods. Resistance is also viewed as a natural response to change that managers should note and attempt to understand, when it occurs. [83]

Hudron K. Kari discussion of the empirical findings of the research is as follows: about 80 per- cent of Nigerians live in rural areas and are predominantly poor farmers and fishermen, of whom about 90 percent are illiterate in the Western sense. They lack basic information infrastructures such as internet, libraries and information centres, and electricity. The oral tradition is still prevalent and written communication remains elusive because a majority of the populace is still illiterate. Rural dwellers show positive response to the services of information agents such as agricultural extension workers, rural health workers, etc. [84]

Samuel Olu Adeyoyin expresses that that the result of the findings showed that out of about 370 professional librarians, only 179 of them were ICT literate while the remaining 191 professional librarians were ICT non-literate. This constitutes an overall percentage of 48.38 percent for the literate professionals as against 51.62 percent for ICT non-literate professionals. Also, out of 526 paraprofessionals, only 84 of them were ICT literate while the remaining 442 were ICT non-literate. This also constitutes 15.97 percent for the literate paraprofessionals as against 84.03 percent for ICT non-literate paraprofessionals. Other staff totalled 1,471. Only 190 of them were ICT literate while the remaining 1,281 were ICT non-literate. This also constitutes 12.92 percent for the literate other members of staff as against 87.08 percent for ICT non-literate other members of staff. [85]

Sheila Corrall analyses the way that higher education library services are viewed, planned and managed. There must be a change radically if they are to survive and thrive in the future. Advances in technology, economic and political pressures, and socio-demographic factors have combined to create an environment posing unprecedented challenges and opportunities. The Joint Funding Councils' Libraries Review has highlighted the need for stronger management and more confident involvement in institutional planning and organizational change. Electronic communication will transform service provision, with significant shifts towards the distributed networked services, empowering the end-user and offering new roles and responsibilities to information intermediaries. Effective communication between library, computing and academic staff will be essential to ensure relevant and responsive services. New resource models will be required to take account of diverse customer needs and different modes of

delivery. Organizational structures and management styles must be changed to meet the future needs and human resource development must be given higher priority. Bold leadership will enable the libraries to enhance their strategic role and respond positively to environmental change. [86]

Rowena Cullen expresses that the phrase "Digital Divide" has been applied to the gap that exists in most countries between those with ready access to the tools of information and communication technologies (ICTs), and those without such access or skills. This may be because of socio-economic or geographical factors, educational, attitudinal and generational factors, or because of physical disabilities. The paper reviews recent research concerning the digital divide in New Zealand, and the factors that alienate people from enjoying the benefits of information technology and participation in the knowledge economy. While socio-economic factors affect the use of ICTs by urban Maori and Pacific Island communities, and rural communities are affected by inadequate telecommunications infrastructure, rural Maori are even more disadvantaged. The paper examines the strategies used in the USA and the UK at national and regional levels to address similar issues, including the use of libraries to reduce the digital divide, and compares these with New Zealand initiatives, to identify the positive means of increasing the participation in the knowledge economy. [87]

Rita Marcella discusses the second stage of a pilot study, funded by the Economic and Social Research Council, which investigated the impact of technology on the communication of parliamentary information to the general public. This second stage tested the application of a new data collection tool – an interactive, electronically assisted

interview delivered in a roadshow environment. The approach was tested in the context of the public's need for information about the UK Parliament, the Scottish Parliament and the National Assembly for Wales. Interviews were carried out by a researcher, aboard a minibus equipped with a laptop and mobile data transmission equipment, who assisted the members of the public in exploring and responding to parliamentary and devolved Assembly Websites. Roadshows took place across the UK at organisations such as public libraries, community centres, sheltered accommodation and universities. Discusses in critical detail about all aspects of the execution of the methodology and draws conclusions as to its validity for future research. **[88]**

Suzie Allard shows that knowledge creation relies on melding powerful technological tools with efficient human organizations. Digital libraries (DLs) provide the technological mechanisms to cross the national and disciplinary boundaries, and promote an organizational structure that encourages communication between scholars who are both creating and consuming information. The DL is especially good at coordinating and integrating the findings about a specific topic that is being studied by different disciplines and different nations, which is an essential component to our knowledge. This paper will briefly outline the knowledge creation process, and will introduce the author’s SEEK model (structure for encompassing extensible knowledge) that provides a framework for exploring the relationship between technology and human organizations in the international interdisciplinary knowledge creation. The paper will also introduce two models of electronically-based scholarly organizations that promote

international collaboration and facilitate knowledge creation, and will offer eight steps towards building the effective organization for utilizing DLs for international collaboration. [89]

Sunday Ighovie Efe discusses the results and it showed a low level of automation, because only two of the meteorological and weather stations in Nigeria are automated. The study also revealed that CLICOM software is very effective in weather information management. Similarly, the result showed that the CLICOM software is highly useful in the making of weather maps, charts and for quick dissemination of weather data, map and other information to students, university and public libraries who request such information. The reasons for the low level of automation were attributed to a lack of funds, faulty equipment and obsolete computer systems. It is therefore highly recommended for the Nigerian government to make use of the available fund for the automation of the Nigerian meteorological stations and weather stations in Nigerian universities to ease data management and dissemination of weather information in Nigeria. [90]

H.M. Khalid, A range of factors has provided the facilities for the maximum use of technology in libraries. This application has marked a new era for library services. A postal survey confirms its lesser use in the university libraries of Saudi Arabia (less than the UK and Malaysia for example) for housekeeping and bibliographic searching. A literature review points out a number of reasons for this lower use, for example, non-existence of a national information policy and the lack of trained staff. Usage can be

increased by taking initiatives by professional organisations and Government agencies. Among these, planning of technology, implementing information policy, developing broader awareness for the use of technology in libraries, establishing staff training and development and user education programmes are particularly important. [91]

Mohamed Haneefa analyses that though the libraries had hardware, software, and communication facilities to some extent, ICT-based resources and services were not reaching the users to the expected extent. Library automation in special libraries in Kerala was largely commenced during the period 1990-2000. CDS/ISIS was used more in the libraries than any other software. The library catalogue found to be the most popular area for automation. The ICT-based resource used by the largest percentage of the users was the e-mail. Most of the libraries were hampered by lack of funds, lack of infrastructure, and lack of skilled professionals to embark on automation of all library management activities and application of ICT. A good number of the library users were not satisfied with the application of ICT in their libraries and indicated "Inadequate ICT Infrastructure" as their major reason for dissatisfaction. They proposed a variety of measures of formal orientation and training on ICT to become more effective users. [92]

R.B. Okiy expresses that Identified obstacles militating against effective application of ICT in university libraries to include inadequate funding, inadequate electricity supply, shortage of competent manpower for operation and maintenance of ICT facilities, lukewarm attitude of the Nigerian government towards the provision of ICT facilities and low level of computer literacy among the Nigerians. [93]

A.A. Oduwole analysis of the returned questionnaire revealed that 16 federal universities and two state universities have automated their cataloguing processes by using the TINLIB software, while two others use the LC and CD-ROM database to aid the cataloguing. Automation of the cataloguing process has increased the efficiency of the cataloguing processes in the Nigerian university libraries, which in turn has resulted in increased productivity. The high cost of maintenance of the TINLIB software was identified as the major constraint to the use of the software. Other constraints include poor computer literacy on the part of the librarians, incessant power-cuts and lack of infrastructures. [94]

Brendan Fitzgerald explains that article explores the impact on public libraries in Victoria, Australia, as they become increasingly reliant upon information communications technology (ICT) to manage access and deliver information services. Libraries Online and Rural Libraries Online have, since 1998, been developing Internet access in Victorian public libraries. Funded by State (Multimedia Victoria) and Australian Federal (Networking the Nation) and delivered by VICNET, a division of the State Library of Victoria, these projects have provided a library approach to e-services which includes provision of bandwidth, infrastructure, ICT skills, and content. The specific projects such as satellite delivery of bandwidth, rural points of presence (POPs), Victoria's Virtual Library, the Gulliver Consortium and the SWIFT Initiative are discussed. His critical aligning of the actual ICT models and implementations is the capacity of the 44 individual public library services to understand and meet the ongoing issues. [95]

Lisa J. Barlow studied a survey undertaken between January and March 1998 which investigated the use of information and communication technologies (ICT) in a sample of 120 industrial and commercial libraries. Ninety-six per cent of the organisations which responded to the questionnaire use computers for some aspect of their library and information services. ICT was used for a range of office and other applications including, in rank order, e-mail, word processing, spreadsheets, presentation packages and database management systems. Ninety-one per cent of the sample were used for various Internet facilities including e-mail, World Wide Web, file transfer protocol (ftp) and telnet. This paper describes the results of the survey, reporting on the current state of the art of ICT use and future plans for automation in the sample. **[96]**

Ma Ziwei studied In China, explained that libraries can be grouped into three major categories: (1) The public libraries, headed by the National Library of China and including the provincial, municipal, prefectural, and country libraries; (2) The academic libraries under the control of the Ministry of Education, including the university and college libraries and middle and elementary school libraries; and (3) The libraries of the Chinese Academy of Sciences (Academic Sinica), including the science and research libraries. Academic libraries play a very special role in the country among these groups of libraries and are becoming increasingly important, as they are at the centre of information and education on each campus (May 1989). **[97]**

Justin Chisenga contributes to the discussion on the impact of Global Information on Africa with specific emphasis on libraries in sub-Saharan Africa. This indicates that the impact of GI on libraries in Sub-Saharan Africa is closely linked to the status of information technology application in libraries and the state of electronic connectivity in the countries of the Sub-Region. With the current general low level of computerisation and electronic connectivity in libraries in most of the countries in the region, the impact of GI can be noticed mainly in the libraries of the Republic of South Africa, where the state of economic development and information technology infrastructure is the way ahead of the rest of the sub-continent. Libraries in South Africa are using the Internet for electronic publishing and provision of and access to electronic information services for the library users. Most of the libraries in other countries, which have established full Internet access, only have access to e-mail facilities, and are not exploiting the facilities fully. He concludes that, unless libraries are properly funded, equipped, and well staffed, they will not be able to take advantage of the Internet access being established in sub-Saharan Africa and will consequently be left out in the race for the establishment of a Global Information infrastructure. **[98]**

Elisam Magara's analyses of the application offered by different organisations in Uganda and give a way forward for the usage of digital libraries. A qualitative approach with a purposive sampling strategy was adopted. The study was limited to practical experiences on the services and applications that made the basis of analysis. The results indicated that the majority of organisations apply IT in bridging access across networks

and sharing of information between different organisations. It was observed that the current ICT systems in Uganda do not enable it to reach the majority of the community. It is concluded that digital libraries and electronic technologies have contributed effectively to collaborative applications among the institutions in Uganda. The author recommends that services need to be integrated into the organisations strategic objectives coupled with knowledge and skills. [99]

Alemna, M. Cobblah studied that Africa is ready to pursue developing digital libraries in a more earnest way but lacks some basic resources. Information technology is expanding throughout Africa but at a slower pace, yet with intense efforts directed towards training and implementing more automation. [100]

Marian Shemberg explains that in the late 1997 / early 1998's, we conducted a survey dealing with library provision of electronic journals and other electronic resources. We compared the responses from a census of Association of Research Libraries (ARL) to a sample of non-ARL Master's, Doctoral, and Research institutions. Of the 299 libraries surveyed, 250 surveys were returned for the response rate of 83.6 percent. Analysis of the responses emphasizes the number and types of computers available in libraries, electronic resources in libraries, past and future cancellation decisions and archiving responsibilities. It was determined that both ARL and non-ARL libraries offer extensive electronic services to their constituents. Libraries are beginning to cancel the paper journals in favour of electronic versions. There is a little consensus about who will archive electronic journals. [101]

Dan Arbour expresses that Information Technology is fueling a revolution in the US libraries. UMI's market survey shows that the proliferation of CDROM, database licensing and computer networks are allowing the information professionals to provide extraordinary new levels of service to a variety of researchers. **[102]**

R.T. Mulimila discusses the information environment of a given society currently revolves around the ability to use and manipulate information technologies. This paper reviews the trend of information technology (IT) applications in East Africa government-owned university libraries for the ten years (1987-1997). By 1997, East Africa (Kenya, Tanzania, and Uganda) had only eight government-owned university libraries. The trend of IT applications in those libraries was surveyed by using a questionnaire and the review of available literature. It was revealed that the extent of IT applications in those libraries from 1987-1997 was very limited. By 1997, only one government-owned university library in East Africa had automated its library catalogue and books circulation control. Financial resources and lack of trained manpower in IT remained the most critical obstacles in the application of information technology in East Africa government-owned university libraries. **[103]**

Rowena Cullen analysis revealed that new technologies in reference and information work place increasing the demands on reference staff to acquire skills with the technology itself, to develop and evaluate new services and sources, and to train the users in their optimal use. These demands for new skills create the training needs among the staff offering the services. This paper reports on a survey carried out in the libraries of

Guangzhou and Wellington that investigated the use of technology to provide information services in these libraries, the training that had been provided and areas where libraries felt there were still unmet needs for training. Although Chinese libraries were using a similar range of technologies, training programmes and needs varied between Chinese and New Zealand libraries. [104]

Muhammad Ramzan discusses that the utilisation of information technology (IT) has become an indicator of a country's wealth level. Countries, which fail to prepare for information technology and do not use it properly, are likely to lose their global competitiveness. Muslim countries have paid little attention to leverage the benefits offered by the IT usage in their library and information centres. The first part of this paper reports the status of information technology applications in libraries and information centres of Muslim countries. The second part of the paper reports the level of hardware, software, and IT-based resources available in the libraries and information centres in Pakistan. The third part of this paper discusses the problems hindering the wider use of information technology in the libraries and information centres in Pakistan. Based on the findings of the survey and documentary research the final part of this paper puts forward overall suggestions to solve the problems by hindering the wider use of information technology in the libraries and information centres in general, and in Muslim countries in particular. [105]

Kinengyere, Alison Annet has revealed that Uganda has gone a step forward in ensuring that information resources available for researchers and students are maximally utilized. Academic and research libraries are participating by supporting and achieving

the missions of their respective institutions by teaching the competency of information literacy (IL). This paper seeks to examine the effect of IL that has had on the usage of electronic information resources in academic and research institutions in Uganda. It aims to focus on the innovations that Makerere University Library (the biggest and oldest academy library in Uganda) has undertaken to ensure that library users (the Makerere University community and other collaborating universities and research institutions in Uganda) are trained on how to access a variety of available information resources, evaluate the information and apply it to address their needs. Data were collected for the study by conducting interviews to both the library staff and the users of the selected institutions: two library staff in charge of e-resources and ten students / researchers were interviewed from each institution. However, user's statistics for the years 2004-2005, as well as the IL training sessions conducted, were the main sources of information. The study focused on academic and research institutions- Makerer University, Uganda, Martyrs University, Nkozi and National Agricultural Advisory Services (NAADS)

The researcher is physically involved in the IL program in Makekrere University. The usage statistics were compiled and interpreted. The paper finds out the availability of information which does not necessarily mean the actual use. The study shows that some of the available resources have not been utilized at all. This means that users are not aware of the availability of such resources, they do not know how to access them, or they do not know what the resources offer. Their attitudes and perceptions also influence the level of utilization. The paper shows the extent of information literacy and its influence on electronic resources in Uganda. It points out the challenges for the future and provides a number of recommendations for the way forward, which will be helpful,

both to the relevant communities in Uganda and to other academics in similar circumstances. [106]

Miroslaw Górny reports that the results of an inquiry were directed to Polish academic, research and scientific libraries. An appraisal of the current IT infrastructure, degree of advances in automation of libraries, and utilization of the electronic sources has been carried out, based on the completed questionnaires received from the libraries in question. It has been recognized that the best developed IT infrastructure is to be found in the academic libraries and that they are well prepared for automation. The situation is much worse in the special libraries of the research and scientific institutes. Half of the libraries in the latter group are not engaged in any preparation for automation, mainly owing to a lack of financial resources. Also, they do not provide the readers with access to the sources in an electronic format. He points out that a relevant consistent programme for the implementation and utilization of IT in Polish libraries has not yet been prepared. [107]

British Library Research and Development of Library automation programme supports the research which is aimed at improving the efficiency of library operations through the usage of computer systems and other forms of automation. It includes: the evaluation of applications of Information Technology in libraries and information units; investigating various methods of storing, retrieving and processing library records; and improvement of library systems to make them more effective and simpler to use. It also provides support for various information and demonstration services to provide the librarians with data about library automation to aid their decision making. [108]

R. Olorunsola states that the use of information technologies in the provision of information and communication in the libraries has had a far-reaching effect on the librarians and the library users. He points out that the provision of information can be made more effective and efficient with the use of electronic information, and examines the extent to which electronic information sources have been used in Nigerian libraries. The paper reveals that there is nothing to show a widespread or intensive use of electronic information in Nigerian libraries. It identifies some problems facing the application and the usage of electronic information sources and proffers suggestions on how to overcome them. **[109]**

Syed Sajjad Ahmed reported that an e-mail survey of seven Arabian Gulf University Libraries was conducted in order to ascertain which types of Web-based services they offer to the users. The study specifically looked at the provision of access to the Web-based services such as Catalogues, Search Engines, Forms, etc. through the respective library Web sites. Findings showed that almost all the libraries are offering Web-based services to the users in one way or the other. This paper also discusses the ways to improve and reinforce the provision of such Web-based services, including effective methods of creating awareness and delivering the orientation and necessary training to create a positive environment for change. Finally, the results of the study may be helpful especially to the librarians of the Arabian Gulf libraries in enhancing or developing quality web-based services. **[110]**

R.B. Okiy discusses the second stage of a pilot study, funded by the Economic and Social Research Council, which investigated on the communciation of parliamentary information to the general public. This second stage tested the application of a new data collection tool – an interactive, electronically assisted interview delivered in a road shows the environment about the UK Parliament, the Scottish Parliament and the National Assembly for Wales. Interviews were carried out by a researcher, abroad a minibus equipped with a laptop and mobile data transmission equipment, who assisted the members of the public in exploring and responding to parliamentary and devolved Assembly Websites. Road shows took place across the UK at organisation such as public libraries, community centres, sheltered accommodation and universities. He discusses in critical detail about all the aspects of the execution of the methodology and draws conclusions as to it validity for future research. **[111]**

Suzie Allard explains that knowledge creation relies on melding powerful technological tools with efficient human organizations. Digital Libraries (DLs) provide the technological mechanisms to cross the national and disciplinary boundaries, and promote an organizational structure that encourages communication between the scholars who are both creating and consuming information. The DL is especially good at coordinating and integrating the findings about a specific topic that is being studied by different disciplines and different nations, which is an essential component to our knowledge. This paper will briefly outline the knowledge creation process, and will introduce the author's SEEK model (structure for encompassing extensible knowledge) that provides a framework for exploring the relationship between technology and human organizations in international interdisciplinary knowledge creation. **[112]**

Sunday Lghovie Efe results showed a low level of automation because only two of the meteorological and a weather station in Nigeria is automated. The study also revealed that CLICOM software is very effective in weather information management. Similarly, the result showed that the CLICOM software is highly useful in the making of weather maps, charts and for quick dissemination of weather data, map and other information to students, university and public libraries who request such information. The reason for the low level of automation was attributed to the lack of funds, faulty equipment and obsolete computer systems. It is therefore highly recommended for the Nigerian government to make use of the available fund for the automation of the Nigerian meteorological and for the automation of the Nigerian government and for the automation of the Nigerian meteorologcal stations and weather stations in Nigerian universities to ease data management and dissemination of weather information in Nigeria. [113]

Sheila Corrall, discusses the way that higher education library services are viewed, planned and managed. There must be a change radically if they are to survive and thrive in the future. Advances in technology, economic and political pressures, and socio-demographic factors have combined to create an environment by posing unprecedented challenges and opportunities. The joint funding councils Libraries Review have highlighted the need for stronger management and more confident involvement in institutional planning and organizational change. Electronic communication will transform service provision, with significant shifts towards the distributed networked services, empowering the end-users and offering new roles and responsibilites to information intermediaries. Effective communication between library, computing and academic staff will be essential to ensure the relevant and responsive services. [114]

Rowena Cullen says that the phrase “Digital Divide” has been applied to the gap that exists in most of the countries between those with ready access to the tools of information and communication technologies (ICTs) and those without such access or skills. This may be because of socio-economic or geographical factors, educational, attitudinal and generational factors, or because of physical disabilities. The paper reviews the recent research concerning the digital divide in New Zealand, and the factors that alienate people from enjoying the benefits of information technology and participation in the knowledge economy. While socio- economic factors affect the use of ICTs by Urban Maori and Pacific Island Communities, and Rural Communities are affected by inadequate telecommunications infrastructure, rural Maori are even more disadvantaged. **[115]**

Bakari’s research is about the improvement of the ICT security management process in non-commercial organisations in order to reduce the possible financial damage, taking into consideration the realities found in developing countries. The research took place in a developing country -Tanzania, where five organisations were involved **[116]**

Peansupap’s study is organised into seven papers covering: The state of ICT security management in the organisations; Prerequisites while utilising the existing ICT security management approaches in attaining a solution for managing ICT security in the organisations; Issues and challenges of managing ICT security; Important aspects to be taken into consideration in order to successfully manage ICT security; and how the

management of ICT security in non-commercial organisations could be improved. Among the others, the research was motivated by the observed need for bridging the perception gap between the management and technicians while dealing with the ICT security problem, and consequently extending to a common understanding by the staff in the various departments and specialties within and among the departments.

The thesis contributes to the increased empirical knowledge on the importance of the holistic ICT security management process. Particularly, our main contribution is the proposed holistic approach for managing ICT security in non-commercial organisations, organised in the form of guidelines with two main phases: the initialisation phase which involved the introduction of the ICT security management process in the organisation; and the internalised and continuous phase

The research aims to understand the nature of ICT diffusion at the intra-organisational level. It uses both quantitative and qualitative research approaches to identify the factors and the process influencing ICT diffusion at the actual implementation phase. The result indicates that management, individual and technology group factors are essential to ICT diffusion at the initial adoption stage. In addition, the integration of change management and knowledge sharing and learning theory to diffusion of innovation theory can help to better explain ICT diffusion at the actual implementation stage. **[117]**

Waller expresses that there is an interdisciplinary qualitative study which uses an exploratory research design and builds on Fariclough's Critical Discourse Analysis methodology to analyze the discourses surrounding an Information and Communication Technology (ICT) for livelihood development project in Jamaica, introduced by the United Nations Development Programme – the Jamaica Sustainable Development Networking Programme (JSDNP). The primary objective of this project is to provide the poor in Jamaican communities with access to, and training in ICTs. In this research, I specifically focus on the discourses surrounding the JSDNP Cyber centre Project for a group of micro enterprise entrepreneurs in the Jamaican tourism industry to access the epistemological assumptions of this project. From the data collected it was found that at one level, the JSDNP Cyber centre Project encouraged the specific ways of acting and organizing the congruent with the configurations, processes and structures of corporate firms of industrialized countries, by representing the achievement of livelihood expansion through the use of specific ICTs in a particular way which excluded other discourses. The particular ways of acting and organizing promoted by the Cyber centre encouraged the use of non-indigenous technologies, undervalued indigenous technologies and excluded the indigenization of non-indigenous technologies. These discourses were incompatible with the operational and the structural configurations of trans-temporal poor entrepreneurs interviewed and were more favourable to the non-poor and patio-temporal ones. One of the wider implications of the discourse therefore was that they play a fundamental role in perpetuating the entrenched inequalities through the preservation of social practices, along with their associated systems and structures. It was also found that these modalities limited the operational processes of all micro enterprise entrepreneurs

who were exposed to the Cyber centre Project. These entrepreneurs have limited control over the configuration of non-indigenous technologies; their technological and creative capabilities are restricted; their ability to indigenize the non-indigenous technologies are impaired; and they are highly dependent on non-indigenous technologies (which themselves have a number of limitations). **[118]**

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