CHAPTER - II

REVIEW OF RELATED LITERATURE

2.1 INTRODUCTION

This Chapter provides various kinds of inter-related literatures, which may guide a perception to the present study. The basic requirement of any research is the units of theory, which should be defined with sufficient clarity to enable the researcher to proceed. A Comprehensive review of literature is a necessary integral part of any research endeavour, as it helps to identify the gap in research and aids the investigator in designing and analysing research work. It also provides basis for interpretation and discussion of findings.

Documents relating to the present study are collected from several sources such as LISA Online, Science Direct, LISTA, DOAJ, Emerald, Google scholar, COMPENDEX etc.
2.2 Information Management :

*Gunter and Barrie* ⁶⁴ says that the UK Government has set target for its services, to be available online by 2005. It is hoped that electronic public services will improve quality and efficiency of delivery, enhance public access to essential services, and achieve cost economics. While attention initially is focused on the internet as the key platform for online public service delivery, digital television may eventually become the platform of choice. A number of pilot projects and initiatives have been instigated by Government to explore the potential of digital television (DTV). This paper presents a review of early evidence to emerge about DTV services and public opinion from DTV pilots. While DTV can provide wider access than the internet in terms of demographic reach, its limited interactivity and the relearning that viewers will need to undergo, may limit its initial applications and adoption.


It is noted that many universities require courses in management of information systems for their business majors, little information exists as to what objectives should be included in the course, and the course topics vary greatly across institutions. Differences in course objectives even exist within schools, if multiple sections of the course are taught by different faculty. Typically, a significant portion of the class is devoted to database concepts. In many cases, the course requirements include developing a database for a small business. This database project can consume faculty time and resources, especially if student teams choose their own projects and no guidelines exists for faculty reference. In this paper, guidelines for developing a standardized database projects that challenges students while freeing up faculty resources are presented. Experiences in dealing with these project in both face-to-face and online classes at one university, are detailed.
Formson J.W. \(^{51}\) demonstrates how automation has increased the efficiency of the cataloguing process at the University of Botswana Library in Gabarone, Botswana, which has in turn resulted in increased productivity and considerably reduced the backlog in cataloguing activities. Looks at the role of paraprofessionals in the cataloguing process and at of the cataloguer, who has become the coordinator of a bibliographic network.

Jas. N.K. \(^{71}\) defines user education and describes its objectives and components. He explains how a proper user education programme enhances library resources and facilities and justifies the relevance of user education, for the fulfillment of the spirit of Ranganatha’s 5 laws of library science, as laid out in 1931.

Cunha J.L.D.S. \(^{31}\) reports on a study to evaluate the adequacy of the mail survey technique to collect librarianship data, more specifically in the area of user studies. The research was carried out in the Central Library of the Federal University of Paraiba, Campus I, Joao Pessoa, Paraiba, Brazil. A random sample of 400 users was employed to study
the effects of 2 variables; price and postal tariff, on the response rate. It was verified that the general response rate was within the interval reported in the literature.

_Luyt-Prinsen, J.G.B. Subscribes_ 86 explains that, a survey was undertaken of subscribes to the online, printed, and personal profile services of Excerpta Medica. The survey’s purpose was to identify user groups, and collect suggested improvements. The survey showed that most subscribers were commercial organizations, authorized by head librarians (34 percent). Following the survey improvement have been made to the service, resulting in a growth in article request from 45,000 in 1993 to 567,000 in 1994.

_Zuffova, M and Magatova. Z_ 151 describes that 260 respondents took part in a user group study carried out by the Slovak Medical Library in 1997. It discusses the results of the study which covered 2 main areas: user profiles (background, age) and information requirements. Periodicals, followed by monographs and textbooks are the information sources most frequently used by the respondents; the majority of the
respondents are satisfied with the loan services (91 per cent) and with the consultancy services (92 per cent) provided by the Library.

*Wu. H.M.* reports the results of the library user survey, conducted in 1995 by the National Chiao-Tung University, Taiwan. The study found that: the ratio of undergraduate and graduate users is almost the same as that of the registered undergraduate and graduates students; library users fall into 3 groups (undergraduate students, graduate students and professors); the major activities of undergraduate students are Chinese publications for reading and self study. Major activities of professors are Western publications reading and article copying; while the major activities of graduate students tend to embrace those of the undergraduates and professors; the rank (highest to lowest) corresponding to library user satisfaction tends to be in the order graduates, undergraduates and professors. All 3 groups tend to have the same user satisfaction regarding the library online public access catalogue (OPAC), network, book borrowing rules but have different opinions with the services, that are to be improved.
Lin. J.T. etc 83 presents a study which aimed to examine the service use patterns in a university library (the NTHU Library, China) and to compare these with the required service involvements. In particular, it was found that different groups of readers have different user patterns. Furthermore, the results did not show that the lower the degree of service involvement, the more the service was used, not that the higher the degree of service involvement, the less the service was used.

Buch, H. 19 Buch reports that the last survey appeared in 1982. In 1996, 62 percent of users wanted extended opening hours; these were provided on Saturdays. 50 percent thought stocks were good. Users were most satisfied with staff helpfulness, the open access stack, loan periods and automated book requests. Many users know nothing about the information dissemination service, JASON (rapid request system for periodicals in North Rhine – Westphalia), subject work and the Internet. Users wanted more PC work places; these were increased.

Wei, W. 143 describes that study at the Science Library at the University of California, Santa Cruz, employed both questionnaires and
focus groups techniques to gain insight by users and their assessment of Science Library resources. The 2 techniques were conducted with partial independence but conclusions were drawn by pulling together the results of each, thereby capitalizing on the quantitative powers of questionnaires while using the flexibility and synergy generated in focus group sessions. The results were examined by Science Library staff and subsequent changes are in progress. The study documents efforts by library staff to efficiently and accurately meet changing user needs.

*Burns, C.J.*, 21 presents the increasing amount of literature on the study of local and regional history indicates a need for more research on this topic in relation to public libraries. He describes a study to determine the patterns of use of the local history collection at the Saratoga Springs Public Library, New York, which incorporated a questionnaire survey and a review of the literature. He further discusses the 10 questions and their responses, outlines limitation of the study and findings, which demonstrated, that users were predominantly general patrons looking for personal histories.
**Gudel Soderholm** explains that an OPAC user study was carried out at Stockholm University Library, 1987, involving 500 randomly chosen library users, a questionnaire and 136 responses. The object was to study patron use and general attitudes to the OPAC, which determines whether any differences in attitudes and searching behaviour could be found between different user categories. The advantages and disadvantages of the OPAC are noted.

**Karin de Jager**, presents that a survey was conducted among authors of research publications in the faculties of Arts and Science at the University Cape Town to establish to what extent the library services at the university had supported their research activities. It was found that certain significant differences existed in the way in which the members of the 2 faculties had approached the library for research materials required by the researchers had been available in the library system.

**Chopra, H.R.** presents the result of the survey of teachers and students of 15 colleges of Chandigarh and highlights their library needs, purpose of visit, type of library material often consulted or borrowed and
their information seeking behaviour. The result brings out the extent of library and information services being provided in these college libraries. The user education programmes being organized by some of the college libraries are described.

Vollaro J, and Hawkins Donald. T, \(^{142}\) reports that based on a presentation at ONLINE ’85 Conference, New York, USA, 4 Nov 85. describes a group of end users, patent attorneys A T and T Bell Laboratories who do their own searching, although expert intermediaries are available to help them. In 1984, a number of patent attorneys who used data bases available on DIALOG, were surveyed. Time and convenience appeared to be major reason for end user searching. A partial follow up indicated patent attorneys were still enthusiastic about doing their own on-line searchers.

Brember, V.L. and Checkland, PB, \(^{17}\) present that the soft systems methodology developed by P.B. Checkland (see Journal of Systems Engineering 3 (2) 1972, 87 – 116) was chosen as a way of relating the evidence of a user survey to the practical problems of library
management. The user survey has been described in a previous paper (See Journal of Documentation 41 (1) Mar 85, 1-14). This paper presents the methodology and discusses it in terms of the systems approach, before showing how it was used in this case. The outcomes of the study were an indication of the content of a useful model of the users and guidelines for deriving criteria for effectiveness based on the model. Difficulties in using the methodology are described, and conclusions for library management and implications for library and information science research are presented.

Ajileya, E.O. describes a survey conducted at the main library of the University of Ilorin, Nigeria, to determine the use of the catalogue by students and the problems associated with the location of materials on the shelves. Factors responsible for availability and non-availability are highlighted. Results indicate that only 33.53% of books sought were available. Reasons for non-availability are enumerated, and recommendations made for improvement of the situation.


**Sridhar, M.S.**\(^{130}\) attempts to gauge the extent of user participation in collection development at the Indian Space Research Organization Satellite Centre (ISAC) Library and describes document selection procedure at ISAC Library and analysis frequency of suggestions for documents received from users. He suggests reasons for low participation of users in collection development and presents ways of improving the situation.

**Peter Edward Sidorko,\(^{108}\)** The purpose of this paper is to discuss experiences gained from the introduction of a library leadership institute for Asian academic librarians.

**Keralapura, Manjunatha\(^{80}\)** Technology has transformed the way people live. Current day information seekers are empowered with multiple choices of information sources and libraries no longer remain the primary centre for information seekers. With diminishing time and geographical barriers, the world has become a global village and information seekers are stressed with time constraints. It is the duty of library and information professionals to address these tech-savvy library
users' needs and align their services to satisfy them. Recently, the author of this paper conducted a research study on the “Impact of technology on quality of services in technical and management libraries in Karnataka” sponsored by the Department of Scientific and Industrial Research (DSIR), Government of India, New Delhi. The study was approved in 2005 and the final report was submitted to the government in 2007. This paper carries some of the results of this research study conducted by the author in Karnataka state in Southern India.

Fitsimmons explains that the purpose of this paper is to discuss the management of information as a performance standard for leadership. Design/methodology/approach - The approach is to show the importance of managing information well and then discuss how best to accomplish that with specific strategies and examples. Findings - The findings are that library leaders must understand the importance of managing information about their libraries and how to do it well in order to be able to make the best use of that information. Originality/value - The value is in saving time, effort and Angst in decision making, reporting library
status, activities, and making the case for budget requests with administrators.

_Fitsimmons, Gary_ 46 discusses the part that gaining buy-in plays in practicing the leadership performance standard of managing people effectively. Design/methodology/approach - The approach is to show how people are stakeholders and how to appeal to that connection with the organization to gain buy-in for projects and programs. Findings - The findings are that the effective leader can secure buy-in for projects and programs by appealing to the connection of organizational stakeholders. Originality/value - The value is in learning how to advance organizational goals through projects and programs by securing cooperation from all of the people involved.

_Dygert_ 41 discusses American University's integration of library resources and services with the course management system, Blackboard. She describes AU Library's Blackboard site, which provides faculty with information on using library resources in their own Blackboard courses, and models "services" a sample course page. She also provides
suggestions for librarians who wish to collaborate with those managing the course management system on their own campuses.

*Biddle*, 13 states that the Planning Function in the Management of University Libraries ... is a study of the application of long range or strategic planning theory to the management of university libraries in the U.S. and Canada. Its purpose is to identify those elements which appear to be the most significant in influencing the successful application of planning theory in academic library administration through an analysis of specific strategic planning efforts, which have been undertaken by individual institutions.

2.3 Awareness of IT facilities:

*Davis M.* 37 narrates that based on the impact of information technology, developments on the information handling techniques of research scientists, from the perspective of perceived value, or benefits based on subjective evaluation by users. Uses a semi-structured interview utilizing samples from categories of Imperial Cancer Research Fund, UK, staff plus a composite external comparison group. This is
complemented by analyses of library and information services records, particularly statistics of database usage and requests relating to document supply, plus indications of usage of molecular biology databanks, electronic mail and remote login facilities.

*Emojorho, Daniel and Adomi, Awhefe* 44 stated that data gathered through the use of the questionnaire and interviews reveal that most of the staff are not only aware of the existence of information technology (IT) facilities, but also employ them to satisfy their academic desires. From the study, epileptic power supply was adjudged the worst problem encountered in the use of IT facilities, while other problems include high internet service charges, unreliable telecommunication infrastructure, internet traffic congestion due to limited bandwidth and unsatisfactory performance of internet service provider.

*Gayatri Doctor and Smitha Ramachandran,* 55 acknowledge that Installation of the Institutional Repository is complex, requiring technical know-how of different software. Creation of communities and collections, archiving of documents into the Repository, enriching them
with metadata are essential for efficient retrieval of information. Some knowledge of computers and DSpace software is essential.

2.4 Electronic Library and Information Management:

Bleimann,¹⁴ explains that the International project in the area of learning and is currently being developed by a group of universities and companies. It combines three different types of learning and teaching to form a single package offered to students and people in the workplace alike: face-to-face learning, e-learning and project-based learning. The paper gives an overview of the advantages and disadvantages of the different learning methodologies, and describes the new Atlantis approach.

Berube, Linda¹² views, since its inception in 1997, as a Librarian (UK) has been a model for best practice in collaborative digital reference in public libraries. Innovative development, currently includes trialing the integration of virtual reference with the standard web-form service. In addition to a description of the Ask a Librarian services, this paper
provides an overview of digital reference practice, procedures and issues, with particular emphasis on collaboration.

_Mackawa K_, 87 opines that consideration of the use of Web and video in library user education in Japanese university libraries. User education is a facet of libraries, librarianship education and general education. Libraries using the Web for user education include Kansai University using WebCT, Mornoyama Gakuin University using Dialog Web, and Kyoto University with a cross curricula course on information searching. The National Institute for Informatics produces videos to train its system’s users. The national of Multimedia Education provides materials to support school librarians.

_Farha A_, 45 describes that the Saab Medical Library of the American University of Beirut, Lebanon, developed its virtual medical library site in 1997. The spread of the Internet prompted its development, in addition to continuous requests from users to provide such a service for 24 hours a day, seven days a week. The virtual library is dynamic, growing and changing continuously, and the role of the traditional
reference librarian and the end user education programmes had to change to fit this borderless library. Discussess the aim, preparation, problems and lessons learned after three years of the user education programme in a virtual library setting, and how reference work had to change to satisfy the needs of both the system and its users. (Original abstract – amended)

Keller. A and Neubauer,W\(^7\) reports on a user survey at the ETH Library in Zurich to determine how electronic information resources are used. The results indicate that email contacts represent the most important informal information channel. Search engines are of great importance for retrieving information from the Internet. Bibliographic databases are the most frequently used electronic resources offered by the ETH Library. However, the ‘virtual library’, which consists of hyperlinks, is also used regularly. Although the use of electronic journals has risen markedly during the last 2 years, these journals are not yet accessed as often as databases or the virtual library. More than half the respondents would be willing to do without the print copy of a journal if the electronic version was available.
Pinard, J and Savard.R \textsuperscript{111} analyses the results of a survey of personal users of the multimedia library of the Drome department in France, conducted by 3 students from Quebec and the local staff. The main objectives were to measure users satisfaction regarding existing services and identify further needs.

Tenner, E and Yang, Z.Y. \textsuperscript{137} reports the results of the user to determine the acceptance of electronic journals by faculty at Texas AandM university. 350 faculty members were selected. Questions covered the preferred format of journals (paper versus electronics); the reasons for using or not using e-journals; and faculty concerns about e-journals. They were also asked about other journal format choices for library collections and individual subscriptions. The findings suggest Texas A and M faculty are cautiously optimistic about electronic journals but unwilling to forego print journals.

Sharon Wayland, \textsuperscript{126} reports a survey carried out to determine how heavily the on-line catalogue terminals were used; who uses the on-line catalogues and how experienced they are; waiting time and patron
behaviour when the terminals are busy; which catalogues are used most and user satisfaction with each; and overall level of user satisfaction with the on-line catalogue. 77 questionnaires were given to users at various time periods during a week. 68 questionnaires were completed. The results suggest a marked preference for the on-line catalogue over the microfiche catalogue. Recommendations include: sitting terminals away from the reference desk to avoid embarrassment of the part of new or inexperienced users; and provision of on-line catalogue instructions.

Rader Hannelore B.,\textsuperscript{114} explained academic libraries has become increasingly problematic and competitive during the last part of the twentieth century. Academic libraries manage, collect and provide access to an ever-growing arsenal of information for an increasing number of users in an environment of growing financial constraints. Libraries employ highly trained and educated staff, need complex facilities and sophisticated electronic technologies in order to operate successfully. The economic issues facing libraries in the 1990s and beyond are complex. Today, new approaches are needed to address financial dilemmas of the academic library. Thus, major efforts are underway to increase budgets
for academic libraries through fundraising. Different types of fundraising for academic libraries are examined here and creative methods are detailed, as examples, from different institutions. Some statistics are included to provide illustrations. Related issues of resource sharing, contracts and fee-based services are offered as part of an entrepreneurial approach to library management.

**Herther Nancy K.,** 67 describes more sources for citation information have become available – even many scholarly databases today offering cited reference data – the need to identify, access and manage these resources is becoming acute. Information professionals need to become more proactive in their strategies to support these applications and users.

### 2.5 Strategic Information Management

**Edwards, Catherine and Walton, Graham,** 42 observed that “the libraries of colleges and universities are changing faster than their respective parent institutions. Essentially everything in and around the library is changing: services, technologies, organizational constructs,
ownership and access policies, values and most of the rest” (Riggs, 1997). Invariably this intensity of change will cause conflict on different scales and levels and have serious implications for Library and Information Services. Between 1996 and 1998 the eLib IMPEL2 (Impact on People of Electronic Libraries) project was able to monitor how this conflict was being manifested. Using literature from both the management and librarianship disciplines, the general concepts of conflict are discussed, focusing on causes of conflict, positive and negative impacts and different conflict handling techniques. There is an overview concerning how the theories and ideas on conflict drawn from the management discipline apply within an academic library context. After outlining the background to the IMPEL2 eLib project, examples of conflict found in academic libraries are illustrated using data collected. In February 1999 examples of conflict were reviewed at a study day for librarians who identified causes and possible conflict management strategies. These are also presented.
2.6 Digital Library Management Skill

*Barton, Jane*,\(^{10}\) studied the existing definitions focusing on the technical skill set do not go far enough. In addition, successful digital librarians must forge partnerships and communicate effectively across professional boundaries, thereby enabling them to apply their knowledge of information management and information literacy training in all areas of their institutions.

*Getty, Nancy K. and Others*\(^{59}\) Conducted the Librarians at four academic institutions to present their experiences using four courseware products (Web Course in a Box, Blackboard, eCollege.com, and WebCT) to teach information literacy skills. Objectives, methods, content, and student populations vary from place to place. In all four cases, with some reservations, librarians deem courseware a valuable tool for delivery of library instruction. They agree on the following primary advantages: support for interactivity; support for assessment/grade management; support for distance education; relatively quick development time; relatively low technical skill requirement; and raise the following
concerns: inability to integrate quiz questions into the text of lessons; and diminution of interpersonal contact.

2.7 Impact of I.T. in Information Management

Jayanthi Ranjan, 72 Observed that the rapid pace of change in IT is increasingly influencing the creation, publication and dissemination of educational materials and sharing information. IT facilitates connections across disciplinary, institutional, geographical, and cultural boundaries. Taken together, the computational and communication capabilities in IT offer great promise for supporting continual improvements in academia. They also underscore the need for credible research into the practical benefits and limitations of teaching and learning in settings enhanced by IT.
2.8 JSTOR Information Management

Gauger Barbara.J and Kacena Carolyn, 54 pointed out the authors discovered that use of JSTOR is impacted by a complex blend of additional JSTOR collections.

Shiri, Ali and Molberg, Keri, 127 explained total of 33 digital collections were identified that have made use of some type of knowledge organization system. Thesauri, subject heading lists and classification schemes were the widely used knowledge organization systems in the surveyed Canadian digital library collections.

2.9 ICT Systems Management

Ahuja, Vanita. Dr. and Others, 2 observed the protocols are proposed as a ‘Strategic Model for Enhancing ICT Diffusion in Building Projects’. The framework for the model is discussed at the three levels of study i.e industry, organization and people.
2.10 Educational Leadership Management

*Dealtry Richard,* 39 explained many different attempts have been and still are being made by business and academic institutions to set up working relationships that are intended to work well for both parties. These relationships travel under various titles, with the term “partnership” being the most common. Problems of sustainability and/or quality of outcomes are prevalent as a result of the alliance management perspective being taken on a limited understanding of the total relationship dynamics for success; too narrow a perspective on what dynamics have to be managed. Models for success are, however, readily available.

2.11 Institutional Repository Management

*Gayatri Doctor,* 56 conducted a study which indicates that faculty in business schools from different academic areas and teaching experience do use digital resources for scholarly publications and teaching material, they do indicate a knowledge sharing culture and tend to show a positive
attitude towards the need and use of a Digital institutional repository. Implementing the pilot institutional repository using Open Source DSpace software was an experience and provided visibility to the institutional intellectual capital.

2.12 Role of Libraries in Information Management

John Abdul Kargbo,\textsuperscript{74} explained that the academic library is the intellectual hub of the institution it serves. As an effective instrument for the improvement of educational standards it should make its presence felt and exert its influence on the academic community by reorganizing library facilities and improving its services. Over the years, academic libraries in Sierra Leone have been gradually losing recognition of their role and this is raising concern in academic circles. This article examines the role of these institutions at the University of Sierra Leone.

Roosendaal, Hans E. and Others,\textsuperscript{120} observed that the economic impact of information and communication technology (ICT) on the academic library and on the academic institution are discussed in
terms of changes in the value chain of scientific information induced by the use of ICT. Argues that ICT is a very strong engine for change as it has the potential not only to transform the research information system, but also the educational information system or even the education system at large. Academic institutions will have to create their own publishing and archiving environments using the same technology as in research publishing. These developments will have a profound impact on the value chain of scientific information as it leads academic institutions to assume entirely new roles in this chain and to develop new capabilities. As well as a digital collection strategy, academic libraries will develop strategies for supporting e-learning and e-publishing. This leads to changes in the economic conditions at the institutional and also industrial level. The developments will be discussed in general.

Dalai, B.K and Ramesh D.B, \textsuperscript{32} report results of a study, based on data collected from the circulation desk, daily observations and questionnaire user survey, to evaluate the library resources of the Regional Research Laboratory, Bhubaneswar, India. The purpose of the
study was to determine: the extent of library use; needs and requirements of various categories of users; peak hours of highest usage; and period of transactions at various service points.

Banwell, L. describes UNNDERPIN (University of Northumbria at Newcastle Development and of research into the Provision of Information of Nurses, and nurse educators), an 8 month study to examine library and information services in a climate where there is continued reorganization to support patient clinical care and development. UNNDERPIN has informed the development policy of the university of Northumbria at Newcastle, UK and St George’s Hospital. It discusses conclusion on library services currently available; use of the library service; information needs and information gaps; possible service developments; and strategies for information services that could be used to develop an electronic library service for remote sites or to establish electronic options for information service and delivery.

Omaji, A. describes an interview study of 100 CD-ROM users carried out at Curtin University of Technology Library, Australia, during
1993. The aim of the study was to gather information on whether CD-ROM searchers consulted user support such as search aids (thesaurus and search manuals) and assistance from librarians to help them overcome difficulties such as inability to narrow searches, broaden searchers, or construct search strategies. Results show the usage of CD-ROM databases tended to be suboptimal. A variety of recommendations to improve CD-ROM user support services are aimed at increasing user knowledge, technique and performance.

Chu, S.C. and Ting, K.C. report the findings of a survey of 125 university and junior college libraries in Taiwan to determine the current state of library user education. Findings show that the most commonly used methods of library user education are not those which librarians assume to be the most effective, such as computer assisted instruction. A significant increase was noted in college libraries of the provision of library training programmes carrying academic credit. The survey also demonstrated differences between library training provision in university and junior college libraries. The report discusses problems
revealed in the survey and makes suggestions for the future planning of library user education programmes.

**Harkness Connell, T.** describes that the study explored whether a student is more likely to believe the results from an on-line catalogue than from a manual system. Findings indicate that, overall, they are equally likely to believe either system. However, student’s familiarity with the title searched made a difference. Students who heard of a book found no record for it were more likely to distrust the computer. When the book was unfamiliar and no record was found, they were more likely to distrust the card catalogue.

**Albert Bien,** states that in 1983, the North–Holland provincial library system installed public catalogue terminals in a limited number of libraries. However, because of the high cost of terminals extension of the system was delayed until 1987. In March 89, it was decided to study response times and system reliability, as well as use of the catalogue. As part of the study, 350 questionnaires were distributed to users for which there was a 60% response. Although there was criticism of response
times and unclear screen layouts, the survey showed that the public was generally satisfied with the system. With the help of the suppliers, the system is being improved to meet users demands.

**Sridhar, M.S.** ¹²⁹ reports results of a case study, based on observations of the patterns of library visits, library traffic, user movement and length of stay of Indian space technologists as users of their primary at the ISRO Satellite Center (ISAC) Library and Documentation Division. The study embraced the relative use of different services areas of the library, the in house use of library documents and the intensity of use of the library. There is a total lack of studies of physical interactions of users with the library though knowledge from such studies of real time interactions and a study of user behaviour can help in planning and evaluating physical layouts of the library and in understanding information seeking behaviour of users.

**Davis, H. Charles A** ³⁸ narrates that this study used reference worksheets as the data source. The reference tools used and the amount of time required to answer information requests from 3 user groups
(administrative staff, counselors and consultants) were investigated. Results showed that an in house manual index received the highest percentage use by users and that the administrative staff were the most frequent users of the on-line index. The administrative staff also had the most frequent information requests that involved only a short period of time to answer.

Carvalho A.de O.\textsuperscript{24} describes that the university library participates in the educative process as part of an integrated educational system. This requires a knowledge of the needs of library users, which is gained through library – user interaction. This interaction is affected by the organization and objectives of the library, expectations and personal characteristics of the users, communication channels available and the relevance of information supplied to the user. Some library objectives are mentioned and their priority in fulfilling the expectations of students, teaching and research staff are discussed. Suggested procedures are given for a systematic study of user needs.
Hewitt and Hewitt\(^\text{68}\) focus on the role of assessment plays in academic library management. It states academic libraries are under increased pressure to prove they are an integral part of the academic mission and contribute to student learning while efficiently utilizing resources. It mentions that technology changes make it difficult to plan, implement, measure and evaluate systems and processes due to technological obsolescence. It presents a literature review of academic library assessment methods and comments on the need for academic libraries to create a culture of assessment and on the importance of data acquisition and analysis in assessment.

Forrest,\(^\text{52}\) discusses the improvement of user experience in academic libraries. The implications of automation on the role of librarians and library staff are discussed. The success of libraries is measured in terms of their inputs, the activities they support and their outputs, such as circulation transactions and reference questions answered.
Libraries Plan \textsuperscript{82} the article reports that an online data-management tool for researchers at academic institutions is being developed by several academic libraries, including the University of California's California Digital Library and the University of Virginia Library. Agencies funding the project are also noted.

Soils, Jacqueline, Hampton, Ellen M \textsuperscript{128} the purpose of this paper is to demonstrate the way the University of North Carolina Libraries have begun to incorporate library resources into their university course management system. Design/methodology/approach - The paper presents a case study of course-specific web pages that have been incorporated into Black Board sites as a way to facilitate the use of the library and to promote a comprehensive view of library services and resources at the University of North Carolina at Chapel Hill. Findings - Students and professors appreciate course-specific web pages that provide access to library resources that relate directly to class assignments. Web page usage statistics show that students are using librarian-created course pages to access library materials.
Osuala examined the internal and external managerial roles of academic library directors in Nigeria, applying the Henry Mintzberg/Moskowitz ten managerial role model to determine whether the directors devoted a greater proportion of their time and energy to the internal managerial roles or to external managerial roles. To accomplish this investigation, a survey instrument was developed and adapted from the Moskowitz questionnaires. One role, the educator role, was added to the Mintzberg / Moskowitz ten managerial roles, bringing the total to eleven. The sample included all 30 library directors managing university libraries in Nigeria.

2.13 Issues in Information Management

McClintock Maggie, reports the findings of a study that examined several aspects of information systems at colleges and universities with 5,000 or fewer students. The subject schools were members of either CAUSE or Educom. The information system administrators at these institutions were mailed a survey that consisted of 20 questions that related to institutional demographics, management/
governance issues and finance/budgeting issues. A total of 21 hypotheses were tested for significant relationships using chi-squares at 0.05 alpha level. This article specifically addresses parts of the study that related to information systems management structure, policy setting and resource acquisition.

Renoult. D etc 116 reports, comprising tests of selected presentations, of Franco-British meeting held in Nice in Sept. 95, organized by the French Librarians Association and the UK Library Association. The main focus was on the experience of academic librarians in France and Britain in training users to exploit new technology. Topics covered including development of services at the French national library; involving users in modernization of services; evaluating users satisfaction; the creation of an Internet based national electronic library in the UK; and targeting user education on specific groups. In general, UK university librarians have become the
acknowledged experts in new technology on campus, whereas their French counterparts are as yet marginal.

Michiku Kobayashi, reports that a survey was conducted on 11 hospital libraries and 10 medical college libraries in Japan, to assess the information needs of hospital personnel and thereby improve the information services with the limited resources of hospital libraries. The survey was designed to look into the present situation as it relates to the purpose library use by the health science professionals and their satisfaction; the awareness of librarians to their users’ information activities; and a comparison of hospital library users with medical school library users.

Youngman, describes that academic libraries have faced a variety of challenges in recent years. New technologies and services, rising user expectations, increased materials costs, and spare budgets have all challenged library management. In many cases, staff should be increased, but budget will not support doing so. In other cases, circumstances cause service delivery to users to be impeded. By
objectively documenting and analyzing library processes, problems and
potential solutions can be identified. Process flow analysis is a technique
commonly used in industry, but, when used as a management tool in
academic libraries, it can enhance the effectiveness of existing resources
and justify additional resources.

Pittsley, Kate A. \textsuperscript{112} explains that many business schools now
offer degrees in supply chain management (SCM); yet a review of the
library literature shows no articles devoted to the topic of academic
library support of SCM programs. This article provides practical
information for academic librarians on developing collections to support
SCM degrees. The article describes basic SCM concepts and identifies
relevant Library of Congress subject headings for analyzing book
collections. Because the largest collection costs in supporting SCM
programs are for maintaining serial subscriptions, the author uses a
number of techniques to compile lists of recommended scholarly journals
and trade periodicals.
MOTT, describes that with the various concerns facing academic library administrators today, their ability to provide effective management will take on ever-increasing importance. The library literature reflects this fact. However, there is insufficient research data conducted to ascertain the attitudes and opinions of currently practicing library administrators.

2.14 Knowledge Management in Libraries

Adhikari Dev Raj, dealt article deals with KM and quality education relations. The author believes that this article is valuable to academic leaders to know the issues and challenges of Nepalese academic institutions and apply the concept of KM to achieve quality education goals.

Zakaria Zamzulaila, observed that a substantial number of private institutions of higher education do not have an internal audit function. The study also indicates that the management of both types of institutions have similar perceptions on the role of internal auditors and
the important audit areas as there are no significant differences between public and private institutions of higher education.

2.15 Review of Publications In Operation Management Journals

Babbar Sunil and Others,8 Assessed institutional and individual research productivity in the area of international operations management (IOM) by reviewing publications in 21 leading operations management (OM) journals over the 12-year period from 1986 through 1997. Also assesses the IOM research output of the journals and the relative contributions of academicians and practitioners to IOM research appearing in these journals. Among the journals examined for the 12-year period of this study, based on annual output and quality of published IOM research, Production and Operations Management, International Journal of Operations & Production Management, and European Journal of Operational Research served as the leading outlets for IOM research. The 21 journals published a total of 550 IOM articles over the 12-year period with academicians authoring approximately 86 percent and practitioners 14 percent of this IOM research. The study provides insights
on the IOM research productivity and quality of institutions and individuals and offers suggestions for furthering the cause of IOM research.

Wu Shuling, In recent years, electronic resources have become the library’s important storage of a university library, and the fund purchased electronic resources also increased quickly, year after year. In order to find out the readers’ present conditions, difficulties and requirement of using e-recourses, The Library of Shaanxi University of Science and Technology, carried out sampling, questioning and investigating of all teachers and students at campus. The purpose of this paper is to present the findings of this investigation.

2.16 Libraries and Librarianship

Joseph M. Kavulya, too assessed the status of the job market for library and information science (LIS) professionals in Kenya and the adequacy of current curricula and training resources in LIS training institutions in the country. Secondly, to identify priority areas of training
and critical IT skills required by LIS professionals in relation to current job market and performance requirements.

**Ram Kumar Matoria, P.K.Upadhyay, Madaswamy Moni,** described the development of the library management system, e-Granthalaya, for public libraries in India. This is an initiative of the Indian Government’s National Informatics Centre (NIC). The paper outlines the challenges and the potential of a full-scale deployment of this software at a national level.

### 2.17 Modern Library Management

**Valeda F.Dent,** examined intelligent agents – software components designed to perform complex tasks for the user (with or without the presence of the user) – are used in a variety of settings, from instant messaging and web auctions, to ATM network management and fair traffic control systems. The technology also has applicability within libraries, adding a level of user-oriented control and flexibility to activities such as digital collection management and virtual reference.
The use of intelligent agents to assist users with their searches has perhaps the greatest potential. The purpose of this article is to provide background information on the use of agent technology in information settings, and review three library–based projects that utilize agent technology in a practical way.

*Chris Neuhaus, Kent Snowden,* 26 stated that in 1999 a library marketing committee was created on the University of Northern low campus. The aim of this committee was to heighten administrator, faculty and student awareness of library resources and services. This marketing committee was charged with helping administrators, faculty, and students realize what we librarians already know—that the library is capable of galvanizing, nurturing, and supporting the research of the university community. During 2000 and 2001 various marketing efforts and experiments were employed by this committee including promotional newsletters and e-mail postings, student surveys, co-operative marketing studies conducted with marketing students, participation in student and faculty orientations and creative advertising via library pens, library
shirts, online library newsletters and sidewalk slogans. While results from this ongoing experiment are encouraging, committee members discovered that significant time; effort and money can be expended in marketing a library.

2.18 Periodical Publications Management

*Patricio del Sol, F.Maria Luisa Arenas,* described knowledge Alert uses periodicals in ten Chilean University and the latest automated, computer and telecommunications technologies available, to provide the services of co-operative serials acquisition, and current awareness / individual article supply. It describes the knowledge Alert legal structure, which includes an incorporated company owned by the participating universities to present the procedures and software developed to produce the co-operative acquisition and the current awareness services. When a periodical issue arrives in the serials department of a library, the table of contents is faxed to a central computer, which automatically transfers it to any user registered for the title. Users in their turn can ask for a fax of an abstract of the article, or for a fax or photocopy of the complete
article. It includes the finance strategy for this company for the coming years and explains the key factors affecting its future success.

2.19 Digital library management

*Woodyard, D,* 146 reports on the high priority the British Library gives to digital material preservation, with all its collection strategies now having a direct or implied digital component. The report lists types of digital materials already acquired, and sets out preservation policy objectives, including pressurizing the government for new legal deposit legislation. It describes various projects in which the library is involved on different aspects of digital preservation, including archiving the email of literary figures, specific scientific collections, and significant web sites, as well as the Cedars and Locks projects. A major project is a computer system called the Digital Library Store, based on the Open Archival Information System (OAIS) reference model. Collaborative projects include involvement in the Digital Preservation Coalition (DPC) and in two OCLC/RLG working groups, and links with the National Library of the Netherlands.
Deegan, M Tanner, S \(^{40}\) fears that the ever changing information available through the digital revolution on the Internet, through email, text messaging and the Web, may cause a digital black hole in knowledge and culture. While large programmes of retrospective conversion of traditional materials into digital format help preservation, which ever have a digital form. Faced by the accelerating rate of replication, adaptation and redundancy of hardware, software and data formats, it outlines some of the various national and international initiatives in the field of digital preservation.

Breeding, M \(^{16}\) discusses the preservation of digital information and the challenge of building collections that will outlast current technologies. The long term preservation of digital material requires a commitment to an ongoing set of processes that will move it through each generation of technology. A strict adherence to all appropriate standards will increase the likelihood that digital objects will migrate into the next generation with the least amount of content loss, greatest efficiency, and lowest cost. He gives examples of initiatives to create
permanent digital collections, and provides details on the Open Archive Information System (OAIS).

Rothenberg, J 121 Emulates the use of a program to make a new computer behave like an old computer, allowing the new computer to run any program that ran on the old computer. Examines: emulation in the context of other proposed solutions to digital preservation; the advantages and challenges of using emulation to preserve digital artifacts; and two alternative approaches to running emulators on computers in the far future. (Original abstract - amended)

Campbell, L E 23 expresses that Legislation enacted in the USA in Dec 2002 allocates funding to the Library of Congress to lead the National Digital Information Infrastructure and Preservation Program (NDIIPP), which is focused on materials created primarily in digital form for which there are no analogue representations, sometimes known as 'born digital'. 'Infrastructure' has been defined as a preservation network of individuals and a technical architecture that provides coherence to local efforts to archive digital works but is able to accommodate change
in response to technical and organizational developments. The progress of the initiative and its implications for research is described. The programme emphasizes collaboration among a wide range of partners, looking towards meeting disparate requirements, and an outreach to many communities and the public. (Original abstract - amended)

*Muir, A,* 95 narrates that there is a global trend towards extending legal deposit to cover digital publications in order to maintain comprehensive national archives. However, including digital publications in legal deposit regulations is not enough to ensure the long term preservation of these publications. National and other deposit libraries are at the forefront of research and development in the area of digital preservation strategies. Most of this activity is of a technical nature. There is some work on developing policies and strategies for managing digital resources. However, not all management issues or users' needs are being addressed. (Original abstract - amended)
2.20 Preservation of digital documents

Beagrie, N\textsuperscript{11} opines that long-term access to and preservation of research collections in digital form is an issue of increasing concern to research libraries around the world. Reviews selected issues, projects and initiatives in digital preservation in the UK. These include the Joint Information Systems Committee (JISC)/National Preservation Office research studies, the CEDARS project, the National Electronic Site Licensing Initiative (NESLI), legal deposit of electronic publications, the preservation management of digital materials handbook and the Arts and Humanities Data Service. He concludes with details of the proposed Digital Preservation Coalition, which aims to develop a UK digital preservation agenda within an international context.

Tjalsma, H D\textsuperscript{140} explains that one of the major challenges facing electronic libraries will be the need to ensure long-term preservation of digital resources. In the Netherlands the Royal Library has recently issued 2 important reports on the use of emulation as a means of ensuring preservation of electronic documents received via legal deposit.
Emulation will allow new generations of computers to run older hardware and read outdated software systems. Results of an experiment with emulation at the Royal Library are inconclusive. Further trials are required.

*Wiggins, R,* \(^{145}\) discusses the challenges of preservation in the digital age. Often content may be born in digital form, live online for months or years, and then vanish without a trace, never to be recovered. Identifies nine causes of such digital death: the replacing of old information with new; content reorganization; death of a sponsoring organization; a sponsor losing interest; sponsors avoiding maintaining historical documents for fear of litigation; lost functionality; media format obsolescence; content format obsolescence; and a disaster which wipes out digital data. Outlines some of the technological aspects of digital preservation including offline archiving using tape and optical storage solutions, rights management issues, and ways to combat media and format obsolescence. Describes two approaches to archiving a web site.
Thibodeau, K, \(^{138}\) contributes to the AIPA international seminar on the long-term preservation of electronic documents, Rome, 31 October 2000 and discusses the factors such as media fragility and technology obsolescence that make long-term preservation of e-documents and digital objects so problematic. The three major groups of digital preservation methods so far used or proposed, which range from those most tightly bound to specific technology to those most independent of it, can be labeled as Maintenance of Technology; Data Format Conversion; and Transformation to Persistent Object Form. The positive and negative aspects of these three groups, whose solutions are not necessarily mutually exclusive, are examined.

Ford, P, \(^{50}\) discusses that the issues surrounding the preservation of digital information and electronic media has moved away from the rather specialized world of libraries and have archives and been projected into the public consciousness by the Enron and similar company scandals. He discusses some of the issues surrounding digital information preservation but pays particular attention to the issues surrounding
recordable media and the reading technologies that can, themselves, dictate the time taken for such information to become beyond access. Choosing a proven, standards based storage system on which to preserve digital archives is an essential element of a digital information preservation system. It illustrates the problems with particular reference to the BBC's Domesday project, which was released in electronic form in 1986 and is now very difficult to access because of the obsolescence of the technology used and was many years ahead of its time.

Gertz, J \(^{58}\) considers three issues relating to the selection of materials for digital preservation: whether conversion to digital form is a preservation action; the contrasts between selection for digital conversion and selection for traditional preservation; and the potential effects on the field of preservation generally. All of these issues are under active debate by many practitioners and, while consensus is growing, many points remain unsettled.

Stephens, D O, \(^{132}\) states that the digital preservation of organizational archives is a global information management problem.
Sets out the basic requirements for preservation. Technological obsolescence and lack of sustained organizational commitment are the main problems. It describes the digital preservation initiative of Pfizer, a USA based international pharmaceutical company, setting out the major features of its central electronic archive and future development plans.

Gould, S; Varlamoff, M-T, presents some of the issues surrounding the challenge of digital preservation and gives an overview of current activity in the field. Topics covered include: the threat of obsolescence to digital information and the costs of data migration; special preservation measures required for electronic documents that have no print original; the concept of the life cycle of digital material, as a way to explore preservation issues; technology considerations; the debate over who, should have responsibility for long-term preservation of and access to digital collections; and the challenge of describing and recording the existence of digital collections. Reports on the IFLA/UNESCO Survey on Digitisation and Preservation conducted as part of a project to set up a worldwide directory of digitized collections.
within the framework of UNESCO's Memory of the World programme. Concludes that co-operation and collaboration are key to guaranteeing long-term solutions to issues surrounding digital preservation.

**Seville, C & Weinberger, E,** \(^{123}\) presents at Preservation 2000: An International Conference on the Preservation and Long Term Accessibility of Digital Materials, 7-8 December 2000, York, England. He aims to assist librarians and archivists when they need to address the intellectual property rights issues, which arise during digital preservation activities. Digital preservation activities may include actions, which infringe intellectual property rights offers suggestions and advice which arise from the Cedars (Consortium of University Research Libraries Exemplars in Digital Archives) experience. He looks at general rights issues in the UK, with an emphasis on copyright, rights negotiation, and preservation license issues.

**Alemneh, D G & Others** \(^{5}\) say that preserving long-term access to digital information resources is one of the key challenges facing libraries and information centres today. North Texas University Libraries have
Review of Related Literature

entered into partnership agreements with federal and state agencies to ensure permanent storage and public access to a variety of government information sources. As digital resource preservation encompasses a wide variety of interrelated activities, the libraries are taking a phased approach to ensure the long-term access to its digital resources. Formulation of preservation policy and creation of preservation metadata for electronic files and digital collections are among the most important steps. The issues related to digital resources preservation and demonstrates the role of preservation metadata in facilitating the preservation activities in general are discussed. In particular, it describes the efforts being made by the libraries to ensure the long-term access and preservation of various digital information resources.

Friedlander, A

narrates that the full text of this electronic journal article can be found at [URL:http://www.dlib.org/dlib/april02/friedlander/04friedlander.html]. In December 2000, Congress passed legislation establishing the National Digital Information Infrastructure and Preservation Program (NDIIPP) in the Library of Congress (LC) (PL
The legislation calls for LC to lead a national planning effort for the long-term preservation of digital content and to work collaboratively with representatives of other federal, research, library, and business organizations. The legislation allocates 100 million dollars for the programme, to be released in stages.

_Cloonan, M V; Sanett, S_, 29 reports on a survey of the activities of thirteen institutions and projects in the USA and abroad that employ or are exploring strategies to preserve authentic electronic records. These strategies include preservation techniques (refreshing, migration, emulation); selection for preservation; staffing configurations; cost modelling; access to preserved records; and policymaking. Particular attention is paid to three broad areas: the evolution of the definition of 'preservation', the role of costing in preserving electronic records, and the gap in policy development in which to situate and strategize the present and future preservation of electronic records. By documenting the variety of approaches that are being taken, the authors seek not only to shed light
on current practices, but also to offer informed consideration on where preservation might be headed.

**Russell, K,** \(^{122}\) presented at Preservation 2000: An International Conference on the Preservation and Long Term Accessibility of Digital Materials, 7-8 December 2000, York, England. The Cedars project (on digital preservation) began in 1998 as part of the Electronic Libraries Programme. Cedars is led by the Consortium of University Research Libraries (CURL) which represents both university and national libraries across the UK and Ireland. The project is based across 3 partner institutions, the universities of Cambridge, Oxford and Leeds. The project provides an overview of the project, focusing on the following areas: background and scene setting for Cedars: April 1998; digital preservation: what do we mean, the Cedars project experience, lessons learned, and next steps.

**McCue, J,** \(^{91}\) explains that the British Library has moved on from treating the Internet as host of many sources of information and now sees it as a vast partwork in itself. For, with more than a billion pages, the Net
is the most powerful publishing phenomenon ever seen. But as well as being uncatalogued, it is impermanent, with the average website lasting just six weeks. How can the BL hope to keep such ephemera on permanent file? (Quotes from original text)

Arthur, C, \(^6\) states that as digital records increase, so does the need to preserve them in readable form. Reports are based on a new project launched by the Digital Preservation Coalition, to keep old information alive.

Hunter, P, \(^69\) opines that as the quest for the paperless office continues, this article reports on current thinking on digital archives. Until recently, just a few organizations needed to worry about maintaining digital data on a long-term basis, but now it concerns just about every major enterprise. A major issue that has to be addressed with ageing archives is the physical longevity of the storage medium and the readability of the format, which may be discontinued.

Burkinshaw, I, \(^20\) considers technologies and processes available to make video archive material, in particular cassette tape, more easily
accessible. It covers preservation, digital VTR formats, library storage systems, and the growing need for a media migration strategy.

Butler, D, 22 expresses that Peer review should be adopted as the principal means of quality control in electronic science publishing, conducting a meeting of publishers, librarians, scientists, and lawyers organized by the International Council of Scientific Unions (ICSU) and Unesco. The form of peer review for electronic journals is discussed. It was agreed that setting up secure long-term archives is a priority, and that common standards for indexing papers are needed to ensure accurate retrieval and cross-referencing.

Jenkinson, B, 73 says that tape often outlasts the useful life of the hardware to replay it, so both must be preserved in order to have any chance of replay in the future. Fortunately, unlike audio tape, all videotape has been manufactured on a polyester base, most of it tension stabilized. It is extremely stable, both chemically and mechanically, and has a predicted life of many hundreds of years. Tape damage would
prevent the signal from being correctly recovered and may appear as dropout or a scratch.

**Sweet, M,** \(^{136}\) uncovers a few stories that belie this presumption. The most important philosophical issue facing libraries today is whether to regard the book as a repository for textual information that may legitimately be decanted into other media for preservation, or as an artefact that contains information that it is beyond microfilm or digital photography to detect or convey.

**Parker, D,** \(^{103}\) interviews with Lynne Brindley, chief executive of the British Library, about the Library's recent document 'New Strategic Directions' which underlines the ambition to provide 'comprehensive coverage, recording and preservation of the published archive'. The discussion focuses on the challenge posed by the digital field. The Library does not have legal deposit for electronically produced material and regards getting it as a high priority.
2.21 The evolution of information resource management:

*Eileen M. Trauth*⁴³ says that from the beginning of its use, the term information resource management (IRM) has had a wide range of meanings. This is due, in part, to its independent development in three different sectors of the information processing community: database management, records management and data processing management. This paper traces the origins and evolution of the concept of information resource management through a review of the IRM literature over the past fifteen years. The methodology involved examining definitions of IRM along the following dimensions: disciplinary perspective, management scope, societal sector, vocabulary and goals. It was found that while the IRM concept evolved in three different arenas with little interaction occurring among them, the current view of IRM represents a convergence of perspectives. IRM, today, has three goals: to maintain a global view of corporate data, to position the chief information officer at a high level in the corporate hierarchy, and to integrate both information and the information technologies. The future success of IRM will depend
upon its ability to incorporate end users into the information management framework.

Nicolas Vibert & Others point that this study explored the bibliographic and documentary information-seeking behaviour of high-level research scientists in the context of ever-developing online bibliographic and documentary information (BDI) resources. Descriptive data were obtained from a nationwide sample of French neuroscience researchers using individual questionnaires, followed by semistructured interviews. French neuroscientists often use online BDI resources instead of indexes and other print resources for bibliographic and documentary searches. The most popular online BDI resources among neuroscientists are the PubMed database and the Google™ search engine, which neuroscience experts described as essential for their work. The participants used them with a wide variety of objectives, such as acquiring new knowledge, finding out about experimental techniques, monitoring publications in their field, looking for information to fuel scientific debate, or retrieving teaching resources. Time constraints
appear to be a decisive factor when it comes to determining the usefulness of a BDI resource. This study suggests that when research scientists can access efficient and exhaustive online BDI resources, those resources quickly become their preferred way of getting work-related information. Hence, direct collaboration of scientists and scholars with librarians and information specialists can put together online BDI resources that include convenient databases and search engines that appears essential. On the other hand, formal training on those specialized online information resources should be introduced in graduate courses. In addition, introducing easily accessible, online tutorials that can adapt themselves to the needs of individual users might alleviate the difficulties users encountered with these systems.

2.22 Information life cycle

Peter Hernon 110 explains that this article, which provides the first in-depth analysis of the information life cycle, traces that concept in policy instruments and the primary and secondary literature. Although these contain a number of references to the information life cycle, that
concept is never fully developed. Furthermore, there are different explanations of the concept. The information life cycle, however, could contribute to the management of information resources as well as to the study of government information policy. The article outlines the stages of the information life cycle and encourages further discussion, analysis, and standardization of a concept that should be evolving, not static.

2.23 Library resources and services

Patricia Davitt Maughan,\textsuperscript{105} describes the results of a survey of seven academic disciplines. The survey showed that all respondents, regardless of academic discipline, consult a narrower range of materials than was expected and regularly consult older published materials. Less surprisingly, respondents expressed a desire for simpler and more integrated search systems.

a) What value do campus scholars in different disciplines place on browsing the stacks? Do they prefer print or electronic resources? How important is the ready availability of collections with significant retrospective coverage or access to timely document delivery services?
Do they rely on the library’s reference and instructional services? These are some of the questions that the library at the University of California, Berkeley (UC Berkeley) set out to answer through research funded by a grant from the Council on Library and Information Resources (CLIR). With this support, the library intended “to develop a set of quantitative and qualitative measures for evaluating the performance and costs of research libraries collections and other types of services.” It also hoped to develop an operational understanding of how collections and other types of scholarly information are currently being used and the costs of providing that information.

b) The library planned to use the results of its research to engage campus faculty in a dialogue about options and alternatives for allocating funds to support a scholarly information system and hoped that any new understanding that resulted from this research could help librarians and academic planners “judge the implications of changing the current ratios of annual investments in print collections, digital resources, cooperative collection development and resource sharing, electronic library resources,
access services, and commercial document delivery ... and allow libraries to make reasonable and defensible decisions about the nature and pace of the transition to the digital library, and the changing character of traditional collection development

c) The proposal specified that the output measures would “derive directly from the needs, behavior, and values of faculty and graduate students ascertained through a study of their behaviors in searching for and using library information resources.

d) The research consisted of three phases. First, a graduate student from the university’s School of Information Management & Systems, reporting to the university librarian, conducted a comprehensive review of the literature. Second, a quantitative study, under the direction the library’s chief scientist and director of Financial Planning & Administration, set out to measure the recorded use of various library resources and services and to study the use patterns of digital library resources. Later, pilot projects were to be designed to measure the costs associated with current use patterns and to test the effectiveness of new
forms of access. The third phase, under the direction of the Teaching Library User Research coordinator and author of this article, involved collecting qualitative data on how faculty and graduate students in several different campus departments use the collections and scholarly information services that are provided by the library and how satisfied they are with these services. Parts one and two of the CLIR sponsored research are ongoing. The results of the third component of the project are reported here.

2.24 Information management: An educational perspective:

_Davenport, L._[^36] considers prospects for information management education in the current climate of educational shakeout. Some barriers must be overcome - lack of awareness of information as a key component of any management training, and confusion about the shape and content of training programmes. The potential role of open learning in training for information management is discussed, as are extensions and adjustments to existing courses which might make them more relevant and accessible.
2.25 Information Management System

 Lei Lu, states that the idea of setting up a design information management system of leather goods was put forward to solve the problems existed in current information management of leather goods. Working principles of the design information management system for leather goods were analyzed in detail. Firstly, the acquiring approach of design information of leather goods was introduced. Secondly, the processing methods of design information were introduced. Thirdly, the management of design information in database was studied. Finally, the application of the system was discussed by taking the shoes products as an example.

2.26 The application of RFIDs in libraries

 Forbes Gibb & Others narrates that this paper starts by outlining the technologies involved in RFIDs and reviews the issues raised by their general application. It then identifies their potential application areas within the library sector based on a generic process view of library activities. Finally it highlights the issues that are raised by
their application in libraries and provides an assessment of which of these issues are likely to raise ethical concerns for library professionals. The purpose is to provide an overview of the technology within the context of the library process and to highlight issues which may raise ethical concerns for the profession. A second paper will focus specifically on these concerns within the context of the professional obligations of the librarian.

2.27 Collaborative geometrics and the Mushkegowuk Cree First Nations

Daniel D.P. McCarth 33 says that the remote First Nation (FN) communities of the Mushkegowuk Territory on the west coast of James Bay, Ontario, Canada are currently facing increased development pressures and the imposition of a government land use planning process. The land use planning process is mandated in the Far North Act (received Royal Assent on September 23, 2010). There is a need for capacity enhancement for community-based natural resource planning and management in the Territory. A number of frameworks are emerging for
addressing change brought on by resource development and building resilience to such change at the community level. Among these include the concept of adaptive capacity. In collaboration with FN community leaders, we explored the use of “collaborative geometrics” tools to foster adaptive capacity. Our action research suggests that collaborative geometrics technologies should enhance the Mushkegowuk First Nations’ adaptive capacity to address environmental and policy change by allowing them to collect and manage data collaboratively (e.g., traditional environmental knowledge, western science) to create opportunities for innovative community development, including natural resource development and management.

2.28 Routing, security and resource management

*George C. Hadjichristofi & Luiz A. DaSilva* 57 explain in this paper we present the implementation and integration of core network functions, including routing, security, resource management, and network monitoring that are critical to the efficient operation of a mobile ad hoc network (MANET). The integration of the aforementioned functionalities
enables them to support one another, forming a cohesive system. We design and implement a new ad hoc routing protocol that can relay connectivity, link quality, or any other information that is globally available to the underlying routing mechanism and use such information to improve routing decisions. Our implementation of resource management and topology control utilizes the connectivity information from the routing protocol to derive topologies that consume less energy and cause less interference. Our key management solution supports IPsec deployment and establishes secure paths enabling secure information propagation for routing and topology control messages, as well as for application data. Moreover, it provides an integrated trust component that can guide trust decisions among nodes in a network. To debug and monitor these core functionalities we implement both centralized and decentralized network monitoring solutions, which in turn extract and display information, such as connectivity and secure tunnels, from our security, routing, and topology control solutions. Routing, security, and monitoring mechanisms support concurrent use of IPv6 and IPv4 addresses. We briefly describe each component of the solution and
discuss the integration of these components into a unified system to support mobile nodes. We describe experiments conducted on a wireless ad hoc network testbed and thus illustrate the interaction between the various technologies. Concluding, we discuss lessons learned and how we make available our implementations to enable further experimentation by the wireless network research community.

2.29 Information resource management in the public sector:

**Brussard, B.K.** In applied informatics, the term information resource management (IRM) is used in many different ways, while in the field of public administration, the term *public sector* covers many different activities and varies for different levels of government from country to country. Here a classification system which defines these different situations is presented. With its use, one may establish a picture of IRM in the public sector. This classification system is used in the Netherlands to formulate policy on information systems and services (IRM) for central, regional, and local government in a more of less coordinated way. It may also be of practical value for comparative
studies of different countries. Our major conclusion is that the structure of a country's public administration has always implicitly been dependent, inter alia, on the information technology available. It follows that, all other things being equal, new information technologies will influence public sector organization and its relations with society as a whole.

2.30 Information management during systems development

Steven D Seilheimer\textsuperscript{133} expresses that proper information management is crucial to ensure productivity during the development of Information Systems (IS). One factor that has greatly impacted productivity is environmental volatility; this can be defined as the rapid rate of change in environments where IS are employed. This problem is compounded by the fact that environmental change is accelerating, as global enterprises become increasingly complex and dynamic in nature. Increasing IS environmental volatility leads to increasing user uncertainty concerning IS needs; this can have a very detrimental effect on the productive development of IS. Current IS development models, such as
the Waterfall, Prototyping, and Evolutionary models, are not designed to accommodate these factors. Hence, a new model is necessary to ensure productive IS development. In this article, the author will discuss an inadequacy of current models, and propose a model to effect greater productivity in the development of IS.

2.31 Role of data dictionaries in information resource management:

Shamkant B. Navathe & Larry Kerschberg 124 The role of information resource dictionary systems (data dictionary systems) is important in two important phases of information resource management:

a) First, information requirements analysis and specification, which is a complex activity requiring data dictionary support: the end result is the specification of an “Enterprise Model,” which embodies the major activities, processes, information flows, organizational constraints, and concepts. This role is examined in detail after analyzing the existing approaches to requirements analysis and specification.
b) Second, information modeling which uses the information in the Enterprise Model to construct a formal implementation independent database specification: several information models and support tools that may aid in transforming the initial requirements into the final logical database design are examined.

c) The metadata — knowledge about both data and processes — contained in the data dictionary can be used to provide views of data for the specialized tools that make up the database design workbench. The role of data dictionary systems in the integration of tools is discussed.

2.32 Information resource management

Sumit Sircar & K.Venkata Rao,\textsuperscript{135} Singapore has made impressive uses of computer technology and aims to be a major source of information technology. This study evaluates its performance in terms of information resource management. Survey data from leading organizations were collected and analyzed, in the areas of planning, information management role, user relations and systems development. The responses were compared against the state of the art in the U.S. as
per the literature. A handful of organizations were found to be following most of the practices prescribed in the U.S., but the others appeared to be much less sophisticated.

Robert W. Blanning, 118 outline a framework for information resource management based on the relational and entity—relationship models of data base management. They are enlarged to encompass the variety of information resources now found in many organizations — including data files, data analysis procedures, text files, decision models, expert systems and knowledge bases, and human information resources.

2.33 Information Literacy

Ashok Naimpally 7 says that this chapter surveys the nature of the discipline of engineering and the role that creativity plays in it. Engineers express their creativity through the design process, and different models of the design process are reviewed. Although not immediately obvious, information literacy is important in this creative process, especially in the concept-generation phase. It is important for librarians to have a basic understanding of engineering and the design process, so they can
collaborate effectively with engineering faculty in creating meaningful information literacy assignments. It is also important for them to understand the communication patterns of engineers.

2.34 Implementing an information commons in a university library

Lindsey Wess ⁸⁴ says that changes in user needs resulted in Colorado State University Libraries’ decision to turn a traditional library computer lab into an information commons. Issues raised during implementation are discussed, staff training modules are described, and the center’s success is evaluated. Training quickly became a critical factor.

a) In academic libraries nationwide, electronic resources have become an important and prominent part of library collections because of the rapid development of the Internet and the World Wide Web. The fundamental structure and organization of university libraries’ services have been impacted by patron demands for accessibility to such resources. The Colorado State University (CSU) Libraries is certainly no
exception. Some academic institutions have responded by establishing areas in university libraries, or elsewhere on campus, that are often described as “information commons.” Although definitions of an information commons vary somewhat, it is generally a specific location designated to deliver electronic resources for research and production that is maintained by technically proficient staff.

b) At CSU, the Libraries’ catalogue is mounted on the Web, and numerous Web-based databases and indexes for all disciplines have been added to support the curricular and research needs of students, staff, and faculty. Almost all computer workstations are located in the main libraries’ Electronic Information Center (EIC). When it was created, the EIC was a traditional library computer lab, designed to provide access to electronic library indexes, full-text databases, the online catalog, and the Internet. Staffed during all hours the building was open, assistance focused on helping users with those resources.

c) CSU Libraries, like academic libraries nationwide, is committed to meeting the challenges information technology raises.
Providing ready access to electronic resources is certainly a critical part of the research process for students and faculty. Adding productivity software to library workstations decidedly helps students compile, compose, and complete the papers, take-home examinations, and other assignments their coursework requires. Numerous students, in fact, asked library staff daily for access to such software. Responding to these student requests, library administration instructed Reference Services to add such software so the EIC would truly be an information commons, and create a training plan that would provide staff with the technological skills the EIC would now require. Many steps were involved in this process. The following corollary project goals were developed in the first month of the process, as the requisite steps became increasingly apparent.

2.35 Expert system in Information management

_Davenport. L_, 35 considers prospects for information management education in the current climate of educational shakeout. Some barriers must be overcome - lack of awareness of information as a key component of any management training, and confusion about the shape and content
of training programmes. The potential role of open learning in training for information management is discussed, as are extensions and adjustments to existing courses which might make them more relevant and accessible.

2.36 The impact of digital information resources

Daniel G. Dorner reports on a research project that used four focus groups and a Web-based survey to determine the impact of digital information resources on the roles of collection managers in research libraries in five major English-speaking countries. The study found that while the actual responsibilities of respondents varied, the levels of responsibility and time spent on activities related to digital resources have generally increased compared to 5 years ago, and those for non digital resources either have increased marginally, stayed the same, or gone down. Strong increases in consortia-related work featured prominently in the survey.
2.37 Electronic Journals:

*Wendy L. West* 144 opines that the growth and availability of electronic journals offer libraries the opportunity to provide end users with quick and easy access to more journals than ever before, thereby creating a complex new workload in academic libraries. Libraries have addressed the evolving challenges unique to electronic resources by creating new policies and workflows and dedicating staff to work on the processes, despite the lack of best practices. In the fall of 2009, a survey was distributed to ninety-five libraries at peer institutions to gather information about their policies and practices for cataloging and managing electronic journals in order to gauge the current status of electronic journal management among these peer institutions. This paper reports on the survey findings related to cataloging approach, sources for bibliographic records, methods for identifying problems, and the staff and staff hours dedicated to electronic journals.
2.38 Library management decisions

Olga Einasto, 99 expresses that the aim of this paper is to demonstrate the use of service quality monitoring as the starting point for service development in academic libraries. The proposed approach to quality research allows gathering essential information to focus strategic planning on the services that are important for users and efficiently allocate the library's resources. A conceptual model of quality of academic library services is proposed based on the focus group research. The library service quality assessment instrument UTLib Qual, based on the Zone of Tolerance concept and an importance-performance mapping method, is described. The possibilities of using the instrument in support of library management decisions are analysed by a case study on the Tartu University Library, Estonia.
2.39 A proposed model for library stacks management:

Hao-chang Sun & Kuan-nien Chen, aim to present a new model of stacks management of libraries. Since space management is constantly an important issue for libraries, especially for those in metropolitan areas. The cost of space is perceived as one of the library's invisible expenses. By changing the layout of the book stacks and the management principles as well as employing the RFID facilities, a new stacks management model called “parent–child–grandchild” model is developed. In the model, three stacks sections with different functions collaborate to facilitate the cost-effective space utilization of the library. Library users’ book seeking behavior is changed toward the positive.

2.40 Status of human resource management in public university libraries

Roknuzzaman. M., conducted a survey in five prominent public university libraries in Bangladesh to explore the extent of Human Resource Management (HRM) usually practiced by them. The survey used a combination of structured questionnaire, unstructured interview,
and observation methods to examine the nature and type of library human resources, their professional categories, management issues including staff selection and recruitment, salaries and wages, job analysis methods, performance evaluation, audit, and promotion, supporting Human Resource Development (HRD) programmes, etc. The study used a five point Likert scale to rank major problems of HRM in libraries, and also to record staff’s opinion on twelve (12) indicators measuring their levels of job satisfaction. Finally, the paper provided future directions for better HRM practices in the common interest of public university libraries in Bangladesh.

2.41 Managers’ perception of information management

Nor Shahriza Abdul Karim, 98 report a study conducted to investigate the progression of information and knowledge management (KM) within the business organizations in Malaysia from the managers’ point of view. Among the objectives set are to identify the information requirements of managers, to identify the need for effective information management (IM) and information managers, and to identify the role and
skill requirements of information and knowledge managers in the organizations. Using survey questionnaires and interviews, the findings provided rich and meaningful information about information requirements of managers and their overall perception of information and KM. The findings also revealed the important roles of information and knowledge managers and their desired competencies as perceived by the managers. Positive perception towards the establishment of a one-stop resource center or library was also reported. Overall, the findings may assist in the initial stage of effective IM and KM strategy by organizations, and in the development of curriculum for the IM program and the related management fields.

2.42 A framework for information management

Michael Middleton, 92 says that an analysis is undertaken of a disciplinary framework for information management suggested by Rowley in 1998 in order to consider its applicability to information services. The analysis uses several case studies that have been conducted on the development of scientific and technological information (STI)
services. These services have all been involved in the creation of bibliographic and associated databases of Australian STI material. The analysis examines information management domains through the looking glass of the Rowley framework which has as its elements the information environment, information context, information systems, and information retrieval. It is concluded that while STI services exemplify information management in terms of the framework suggested, that the framework could be adapted to be of more benefit in expressing the disciplinary basis and its professional setting. This might be achieved by removal of the differentiation between environment and context, and by elaborating the information systems and information retrieval levels further into analytical and operational domains.

2.43 Managing digital information resources

Christine Wamunyima Kanyengo, 27 opines that Permanent access and storage of recorded knowledge resources have been the cornerstone of libraries for centuries. Preserving the integrity of scholarship is one of the greatest challenges facing librarians and
information professionals the world over today. In Africa the issue comes very much to the fore because of the prevailing conditions and the state of the continent's knowledge resources. This paper explores and reviews issues of permanency, accuracy, and integrity of stored digital knowledge resources in sub-Saharan Africa.

2.44 Electronic Resources Management System

Kate Silton, 78 presents the results of a survey on Innovative Interfaces' Electronic Resource Management System (III's ERM). The authors distributed the survey to III ERM users through LISTSERVS in November 2009 and received sixty-one responses. The survey contained seventeen questions that focused on three themes: satisfaction with implementation, impact on workflow, and impact on patrons. The results indicated that difficulty with implementation caused some dissatisfaction with staff workflow, although a majority of informants indicated that III's ERM improved staff workflow to some degree. The major benefits of III's ERM were listed in terms of the product's impact on patrons.
2.45 Decisions in resource management

Patricia Keogh, 106 examines management of microforms at libraries and institutions maintaining an active interest in their own microform collections, defined for the purpose of this study as those not only holding, but still acquiring microforms. Survey results presented here, which identify factors that contribute to retention and discard decisions – including holdings of the same content in different formats – are considered in the context of decision theory. Findings could inform current and future decisions relating to the microforms discussed here as well as to holdings in formats dependent on other technologies that will eventually change.

2.46 Provision of local assisted access to selected internet information resources

Thomas J Waldhart 139 felt that a critical need to provide academic library clients more efficient and effective access to Internet
information resources that have value for higher education. This study examines local systems that Association of Research Libraries (ARL) academic libraries have developed over the last several years in response to this need.

a) Most members of the higher education community know, in general terms, what the Internet is, and most realize that it has affected many aspects of higher education over the last decade. Many are also aware that the changes that the Internet has brought to higher education to date are only suggestive of what it is likely to bring in the future. Indeed, some in higher education believe that computer and communication technology, combined with a rapidly evolving Internet, will contribute greatly to a redefinition of the nature of higher education and academic libraries in the United States. A search of the Chronicle of Higher Education demonstrates higher education’s interest in the subject. From 1995 through 1998, the Chronicle published more than 180 articles and shorter references relating to the Internet and its impact on higher education. Although most of the references focus on the role of the
Internet in instruction and research, many recognize its contribution to institutional service and administration as well.

b) The number of information resources that are available on the Internet is enormous and growing rapidly, and because of their number and their variability in subject, treatment, complexity, language, etc., they provide something of potential value to all members of the higher education community. Offering one measure of scale and growth, Steve Lawrence and C. Lee Giles estimated, in early 1997, the Internet included at least 320 million index able Web pages. Two years later, Lawrence and Giles estimated that the World Wide Web contains about 800 million pages. Defining the size of the Internet in a different way, in 1997, Brian Lavoie, Edward T. O’Neill, and Patrick McClain estimated that the Web consisted of 1.1–1.3 million unique Web sites. As another indicator of size and growth, AltaVista, one of the largest Internet search engines in terms of pages indexed, reported that it indexed approximately 30 million Web pages in 1996, 90 million in 1997, and more than 150 million in 1998.
c) Two recently completed studies of the Internet support the view that it has value for higher education. Joseph R. Zumalt and Robert W. Pasicznyuk found that 61.7% of a test sample of reference questions received at Pikes Peak Library District could be answered by using the Internet alone. They also found that the accuracy of the information provided by the Internet was comparable to that of traditional reference sources and that the Internet sites used were surprisingly durable over the course of the study. In another study, Joseph Janes and Charles R. McClure also found that, when using freely available Internet resources, factual reference questions can be answered at levels of accuracy and timeliness that are comparable to those achieved by using traditional print-based resources.

2.47 Data base management:

Myron Miller, 96 A survey of the literature on Distributed Data Base Management Systems is presented. The problems associated with distributing data throughout a network are summarized into two major areas: Data Distribution and Data Transfer. Each area is described
detailing some of the major proposed solutions to the problems therein. The intention here is to provide the reader with an overview and an extensive bibliography for further study on any aspect of Distributed DBMS.

2.48 Information life cycle

Peter Hernon provides the first in-depth analysis of the information life cycle, traces that concept in policy instruments and the primary and secondary literature. Although these contain a number of references to the information life cycle, that concept is never fully developed. Furthermore, there are different explanations of the concept. The information life cycle, however, could contribute to the management of information resources as well as to the study of government information policy. The article outlines the stages of the information life cycle and encourages further discussion, analysis, and standardization of a concept that should be evolving, not static.
2.49 Knowledge Management

*Jantz, R*\(^70\) examines important issues of knowledge management within academic libraries and how reference librarians can become more effective as information intermediaries. Exploiting knowledge can be a major competitive advantage for libraries, which can translate into better service to users. Focuses on librarians and the information they use in carrying out the tasks for reference librarianship and in organizing a multi-campus library to effectively meet the needs of a large and diverse group of faculty, students and staff. Specifically, a new tool for managing and using informal knowledge will be described, along with the team-based approach that was used to develop and introduce the tool into the New Brunswick Libraries at Rutgers University.

*Prasad, H*, \(^113\) explains that systems include all methods and procedures for collecting and processing information on a particular resources and formatting that data in a manner which is useful for the users. It should meet at least 2 requirements: to bring the information being looked for and to bring the required information fast. Computers
and telecommunication technologies, as information management tools, have brought changes in the organisation of information. Different aspects of information management, and future issues are discussed.

2.50 Health Care Information Management

Sharma. T. N. G, 125 constitutes a major activity of the health care professionals. Health care institutions are considering, and a few are making, large-scale commitments to information systems and services that will affect every aspect of their organisations function. Health care science libraries have to adopt several of the Integrated Academic Information Management Systems (IAIMS) concepts and implement them at hospital library level. The ideal situation in which the healthy professions can profit fully from the rationalization and management of knowledge in the medical school setting is one of reapproachment between the transmitters (teachers) and receivers (students) of information, whether medical or in any other subject.
2.51 Basic Training

*Osswald, A.*<sup>101</sup> expresses that cologne Fachhochschule (technical university) is still planning this course, professional members can participate if they wish. The department, successor to Cologne Library School, is a training place for the higher service grades. New concepts are being developed through consultation with subject experts and questionnaire results. The new course will comprise an extra year's study after basic training for about 30 students annually.

2.52 Automated information Management

*Gumilar, D & Johnson, I. M.*<sup>63</sup> examines the potential and actual use of computer generated information in decision making by UK academic library managers. Considers the general features of management information systems, particularly automated systems, before examining the current state of development of such systems in some UK academic libraries. Problems to be overcome include the crude form of data provided by existing automated library systems, a lack of agreement on what data is required for management purposes, and a lack of
expertise on the part of library staff in interpreting data. The cost of establishing management information systems and the absence of management information systems in the parent institutions have also inhibited their widespread adoption by academic libraries. Original abstract-amended.

Greene, F, 61 presents the interim results of interviews with 8 university librarians as part of a BLRDD funded project on the management information needs of academic heads of departments and the role which university libraries and administrators play in supplying management information to those heads of department. Identifies the organisational goals of heads of department, factors in achieving these goals, and the information needed to manage these factors.

Stephen Richard, 131 presents the results of a questionnaire survey, of 50 university libraries, 36 polytechnic libraries, and the libraries of 7 public bodies (e.g. British Library, Victoria and Albert Museum), in the UK, asking about their management information systems. 78 libraries
(84% responded). Compares manual, microcomputer, minicomputer and mainframe systems.

_Collier. M. W_, 30 considers the impact of information technology on academic libraries in the UK in the next decade and suggests ways in which library schools should adjust their curricula in response.

_Mary Overton. C_, 88 reviews the production and use of management information from computer-based circulation systems in university and polytechnic libraries in the UK. Various types of management information are described. They fall into 3 broad categories: statistical, operational and analytical. Instances are given of the potential usefulness of each type. Particular attention is paid to 'archive files' which are built up from cumulated transaction records. Such files facilitate the study of many aspects of circulation control over varying periods of time. Brief descriptions are given about the management information being produced and used in selected libraries. The main areas where management information is proving useful are fund allocation, loan regulation, and book buying and stock management.
2.53 Management of Information System

_Braisby, P. S. & Others_ present findings of a short study, carried out by Inucon Management Consultants, as a first step towards defining the characteristics of management information systems that would be appropriate for academic libraries. This follows a previous study into similar systems for public libraries (see BLRD report 5893 (87/191)).
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