CHAPTER 2
IT STRATEGY FOR LIBRARIES

2.1 Introduction 26
2.2 Need for IT Strategy 26
2.3 External Influences 27
2.4 User Expectations 28
2.5 IT Strategies for Research Libraries 28
2.6 Library Consortia for E-resources 32
2.7 Marketing of E-library Services and Products 34
2.8 Replacement Policy 36
2.9 Consumables and other Revenue Costs 37
2.10 E-Security 37
2.11 Flexibility in Hybrid Libraries 37
2.12 Training 42
2.13 IT Knowledge of Staff 44
2.14 Strategy for Future Development 44
2.15 Final words on IT Strategy for Libraries 52
INFORMATION TECHNOLOGY STRATEGY FOR THE RESEARCH LIBRARIES

2.1 Introduction

Few years after the new millennium, research libraries need to give priority to Information Technology (IT), if they are to continue as the main point of access for the R&D information. IT is essential for senior management to develop and implement the systems needed for the hybrid library environment. Most of the large research institutes have developed IT strategies to ensure their survival in a changing competitive world. The western libraries have begun to develop IT strategies that deal with the need to respond for the rapid changes in technology, which affect the content. Users must be up to date with the latest system and software if they are to keep pace with the demands of employers. The influence of external factors needs to be given special consideration in formulating IT strategy.

IT is developing on many fronts, which include changes in software, hardware, networking, services and media. The access to information is creating a complex mix of possibility threats and opportunities for research libraries. The scale of investment need for an effective IT infrastructure means that local, regional and national co-operation become essential for future developments. The IT skills required for staff, whether managers or front line staff in future is far higher than it is at present and produce a sharp learning curve. An IT strategy must take these factors into account.

2.2 Need

Defining the need for the IT strategy provides the broad framework of principles on which the detailed IT systems planning can be built.

- The broad need should be to utilize Information Technology to improve library services for the user community. This includes continued development and improvement of existing IT facilities.
The provision of equal access to information for all with the same facilities for access in all libraries and the eventual provision access from their home terminals.

Improving the efficiency of library staff by training and making the most effective use of corporate and departmental information systems.

Incorporating within the staff structure posts dedicated to managing and maintaining IT systems and creating new services from them.

Operating on open systems policy and adopting open standards and protocols, which enable the library to link into external systems.

Seeking partnerships with other organizations and library services for the joint development IT projects.

2.3 External Influences

To be effective, a strategy must be flexible, capable of adapting rapidly to change, coherent and achieve. It must be driven by a vision of the future. There are a number of outside factors that should be taken into account while formulating an IT strategy:

- Demands and expectations of local library users for modern library services
- The local authority's policies on IT, research libraries, access to information and services to disabled users.
- The policies of research library services, which stress the importance of the development of electronic networking capabilities between library services across the country and increasing use of IT for service delivery.
- The aim of connecting all research library services to an information super highway for the benefit of members of society those cannot be able to access electronic information from their own homes.
- To develop a fully integrated electronic research library network.
- The scope for co-operation with other library services locally, regionally, nationally and internationally to provide even greater access to information for local users.
2.4 User Expectations

Library services are using IT, as part of their direct delivery of services to users and this trend will continue in the future also. There are pressures from all sections of R&D community towards end-user access to IT systems in research libraries. Research libraries to increase their IT facilities and new IT based media, multimedia and bibliographic CD's, shareware, Internet access, computer-based open learning etc. is placing new demands on resources.

A new generation of computer-literate library users is no longer satisfied with using print based information. Trying to keep pace with all new forms of delivery of electronic information and the capital and revenue investment needed is becoming increasingly problematic. Library users expect libraries to provide IT facilities with traditional forms of printed information where the cost of doing so is already greater than resources permit.

2.5 IT Strategies for Research Libraries

2.5.1 IT Audit

The need to evolve strategy for IT applications is felt that an analysis of the present situation provides a useful starting point for a detailed consideration of the different components of strategy. All IT systems currently in use should be analyzed and the justification for each element outlined. The degree of integration, compatibility and effectiveness should be examined. Systems may have been introduced as isolated elements, usually as individual projects at different periods when capital became available. The development of networking technology has increased the need to bring isolated elements together into an integrated structure. The IT strategy should identify gaps in provision and the potential of improving and extending existing systems to provide services to users. Current expenditure on maintenance, replacements and upgrades, consumables, electricity, data links etc. should be worked out in detail and the relevant budget headings listed. Present and future revenue costs should be evaluated. Any extension of IT facilities inevitably leads to an increase in revenue expenditure. An IT audit also needs to include an assessment of IT skills within the library service and the present IT training policy.
2.5.2 Library Automation

Library automation has to use a local library system as a vehicle for achieving access to resources outside that system. It refers to the use of computer to serve the needs of library users. The operations of a library get a quantum jump with the introduction of computer. The computer helps to provide a fast and reliable access to the resources available in the library as well as elsewhere. The application of computer in the library operations avoids repetitive jobs, saves a lot of labour, time, speeds up operations, and increases use of library resources. Computer is not only used as a tool for processing the data, but also for data storage, and accessing and automation should always be used as a means to achieve overall better patron services.

The present scenario of library automation worldwide is:

- Vastly expanded storage of indexes, statistical databases and document databases with in the library.
- Full-text storage of documents, complete with full-text key word searching and on-demand printing.
- Access by users to library databases from home or office with direct downloading of information and text on demand.
- The ability to access remote databases across the country and world to download information and text on demand.
- Storage of pictorial and graphic material.
- Availability of 'intelligent systems' providing transparent, one-setup searching and access to various library in-house & remote databases and others.  

The above capabilities and even further technology have become reality. Accordingly, today's integrated automation systems need not limit access to the traditional cataloging, circulation, online access to catalogue (OPAC) and acquisition modules, but must be capable of connecting through the local system into the systems of other vendors, remote bibliographic databases, CD servers on a local area network and the internet. Users expect their library systems are capable of among other things.
Table 1: Different Software and their Modules

<table>
<thead>
<tr>
<th>Functions</th>
<th>LIBRARIAN SUITE</th>
<th>LIBRIS</th>
<th>LIBSYS</th>
<th>NIRMALS</th>
<th>PALMS</th>
<th>TROODON</th>
<th>SANJAY</th>
<th>SLIM++</th>
<th>TLMS (OPAC)</th>
<th>TLMS#</th>
<th>ALICE</th>
<th>TECHLIB PLUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acquisition</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Cataloguing</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Circulation</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Serial Control</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>OPAC</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Reports generation</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Inter library loan</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>-</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Union catalogue</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>-</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>-</td>
<td>Y</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Import/ Export</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>***</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Library Statistics</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Cataloguing of Website/documents</td>
<td>Y</td>
<td>Y</td>
<td>-</td>
<td>-</td>
<td>N</td>
<td>-</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Cataloguing of electronic. Documents</td>
<td>Y**</td>
<td>Y</td>
<td>-</td>
<td>-</td>
<td>N</td>
<td>-</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Stock verification</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Budget Control</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Accession Register</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
</tbody>
</table>

Y=YES, N=NO, # Total Library Management System, ** With Librarian Dossier, *** PALMS uses database file format in the form of .DBF files to export/import file.
Providing seamless integration between system gateway and OPAC modules.

- Providing access to external users on the Internet to the Library’s OPAC.
- Monitoring the usage of remote database that have been accessed through the gateway.
- Accessing the Internet using a variety of graphical interfaces and others.

2.5.2.1 Library Software
The success of any library lies in identifying and enlisting the various sources of information and developing the requisite tools and systems for tapping those resources. The minimum requirement for ensuring such sharing of information is a common format for the maintenance of databases and the requisite technology inputs including software packages. The peculiarity of any library automation package is that, it has to handle the bibliographic databases and effective library automation software should be able to mechanize all the works in the library. Thus, it helps the librarians to find more time for the vital functions of information provision. The major functions of a library automation software are to provide; acquisition, cataloguing, serial control, circulation control, information processing and retrieval, OPAC, report generation, documentation, etc. Apart from the general functions, the library automation software should be able to incorporate the recent advances in Information Technology. The Table 1 provides the different functions performed by the different library automation software packages.

2.5.3 Library Networks
The library’s network, if there is one, should be assessed for its suitability for future development. Electronic networks are vitally important for the future of information provision in libraries. The network must be flexible enough to provide a range of services for users and staff. Many research libraries have wide area networks to allow remote branches to link a central system for issue and discharge of lending items. Some use the links for accessing other services, several libraries have extensive communication networks, which provide countrywide facilities. There is a need to investigate the most cost effective way of developing the communications structures, taking account of the need for access to expanding corporate and departmental systems and external sources of information. Factors such as availability of speed in links need to be assessed.
The aim is to provide access to the full range of information sources available, preferably from multifunctional terminals and to ensure that there is, in remote branch libraries, the same quality and quantity of access to information as in a central reference library and access should be extended eventually to external users.

2.5.3.1 CD-ROM Networks

There is a growing need to provide CD-ROMs on a network. With over 5000 bibliographic CD-ROM titles now published, libraries must rise to the demand for providing network access to these items. Present research library users demand access to more titles following the successful introduction of this type of information access.

2.5.4 OPAC Terminals

Online access to library catalogue has over the last few years become an increasingly aspect of library services provision. The continued enhancement of search facility has brought the benefits of library automation/digitization directly to the hand of the library user. The implementation has substantial increase in levels of usage of library. The rapid retrieval and the interactive capacity with online systems, which permits the search to be modified dynamically as the session’s progress through the use of standard online search capabilities. Online access to catalogue could be even much better, if they include in their database periodical articles.

Most OPAC’s are microcomputer based and are increasingly sophisticated, often providing access to other facilities besides the basic library catalogue, especially if connected via a LAN. The trends towards multi-functional terminals continue in the future.

2.6 Library Consortia for e-Resources

The concept of library consortium has created new method of acquisitions, particularly on databases and collections of electronic journals published by the major commercial publishers. The constitution of such consortia is a consequence both of new commercial practices introduced by certain publishers and of a collective reaction on the part of the libraries. The term ‘consortium’ is derived from the field of economics and refers to the grouping together of different independent companies in order to bring together financial or material resources under a single managing body for the joint
performance of specific operations. A consortium may comprise an informal group with reciprocal agreements between partners or it may constitute a separated legal entity in itself. A purchasing group may be considered as an example of an informal consortium.

The concept of a consortium does not necessarily imply the notion of purchases and that consortia of libraries and documentation centers have long been in existence in order to pursue other joint objectives (production of shared catalogues, joint services and others); this idea is based on a value held highly by professionals in this area, namely modularization and sharing of resources. Nevertheless, the question with which we are concerned here is principally that of purchasing consortia, which is, however, a new concept for many research libraries, which vary in different cases.

2.6.1 Classification of Consortia

Consortia have been grouped into five categories:

- Purchase of specific products
- Institutional purchasing groups
- Regional consortia
- Subject based consortia
- Electronic journals consortia

2.6.1.1 Purchase of Specific Products

Here the group of libraries form on the initiative of commercial companies (agents, distributors) who bring their customers together in order to propose grouped purchase of data from producers. They mainly concern bibliographic database.

2.6.1.2 Institutional Purchasing Groups

This type of group is based on an internal group policy within a given research body or network of identical institutions. Often, such grouping arises out of previous experience of collective negotiation concerning printed documentation imposed by the laws governing research community spending. The groups may restrict to a small number of specific products.
2.6.1.3 Regional Consortia

These consortia are the result of policy initiatives by regional research libraries.

2.6.1.4 Subject based Consortia

The basic underlying principle is often that of subject based resources centers, containing different scientific data of use to R&D communities.

2.6.1.5 Electronic Journals Consortia

The rapid development of this consortium underlines the urgent need for negotiations concerning access to electronic journals. Extension of the consortium nevertheless appears to be dependent upon thresholds, thus accounting for instance for the interest of local groups.

2.6.2 Benefits of Library Consortia for e-sources

The main benefits of library consortia are

- Qualitative gains in terms of products and services (unlimited access, accessible archives, extension of the range of journals available).
- More advantageous pricing systems (in the form of discounts, definitions of a single site, pricing proportional to the size of the institution concerned, guaranteed price stability over a given period).
- Availability of additional funding (either from the administration or from regional patterns).
- Simplification of financial negotiation.
- Institution of a mutual policy between partners (mutual access to collections, computer equipment).
- Development of new technical and organizational skills.

2.7 Marketing of e-Library Services and Products

Marketing is a pervasive activity that all organizations adverently or inadvertently practice it but under different terms. Marketing, the last entrant of all classic business function to the domain of on-profit organization is beginning to gain importance among library and information professionals.10
2.7.1 Marketing Concepts/Techniques

Marketing programme of any organization encompasses various activities, decisions and policies. But those, which are identified as being suitable to enhance the library operations, can be broadly classified under following categories.

- Market research and analysis
- Market segmentation
- Marketing mix

2.7.2 Market Research and Analysis

Market research is a wider term that includes market research, pricing research that looks at marketing, the effectiveness of advertisement and marketing communications. The tools of marketing research can be drawn from the research methods employed. There is a consensus of opinion among marketing experts that the demand and receptitude for information services/products would be more likely to be positive if the design and introduction of that service is preceded by a careful analysis of needs, wants of users and market situation.

2.7.3 Market Segmentation

Library and information professionals may familiar with the concept of market segmentation. Market segmentation is a process of dividing the total market for goods and services into several groups such that the members of each grouped are similar with respect to the factors that influence demand. It is a marketing effort that identifies and analyses differential characteristics of various segments and helps in defining and determining the market potential for a service or product offered by the organization. According to De Saez, segmentation is the division of individual market into smaller, more manageable groups that have clear characteristics. Each of these segments, which are accorded priority in marketing jargon, may be termed as target groups.

2.7.3 Marketing Mix

Once the segmentation analysis identifies various segments with varying specific needs and wants, the organizations gears up to satisfy them by designing a marketing programme with all the tools, which can be broadly grouped into four groups of variables popularly know as four P's. They are; Product, Price, Promotion and Place. These four
variables provide a good framework to match the marketing programme with the wants and needs of different segments. Kotler and Armstrong define marketing mix as a set of controlled, tactical marketing tools that the firm blends to produce response it wants in the target markets.

2.7.5 Marketing Audit

Marketing audit is an evaluative step which studies the results of marketing program by using different measures. It appraises the organization of its marketing performance closely to enable it to take a corrective action. An audit usually explores the external factors like user needs, community patterns and internal factors within the organization; it maps the current position of the organization. A SWOT analysis, acronym for strength, weakness, threats and opportunities is often recommended for conducting an audit. It allows the management to signify and evaluate decisions relevant to the organization – is it something to build on (strength, something to eliminate weakness), something to anticipate (opportunity), or something to outmaneuver (threat)? Hence, it identifies the external threats and opportunities and internal strengths and weakness to develop their strategies. Thus marketing audit sets the stage for next cycle of planning, implementation and reviewing the marketing programme.

2.8 Replacement Policy

A Replacement strategy is needed to maintain the effectiveness of existing systems, because of some equipment may be damaged or stolen. Computer equipment is particularly targeted because of its high resale value. Security measures should be included in the overall cost of every terminal installed. Each year a proportion of a library’s existing computer equipment may need to be replaced because it is inadequate or obsolete. The cost of upgrading a computer’s memory or hard disc capacity may be relatively high and it may be more effective to replace the computer rather than upgrade it. Older terminals including ‘dumb’ terminals are often inadequate for the latest software. These terminals may not be capable, for instance, of being used for CD-ROM searching on a network. Older terminals also create greater maintenance problems. An IT strategy should have some inbuilt flexibility for the gradual replacement of obsolete or inefficient equipment and software.
2.9 Consumables and other Revenue Costs

It is often difficult to estimate the true cost of consumables such as paper, toner for printers, electricity, telephone line charges for online searching and Internet service etc., because these are often aggregated within general budgets. Wherever possible, budgets should be disaggregated into cost centers to make this process easier. What is obvious is that revenue cost increase in proportion to the amount of equipment being added and research libraries face with mounting revenue as well as capital costs for IT in the future.

2.10 E-Security

With more electronic sources being installed in libraries, precautions must be taken to protect valuable equipment. Insurance for e-sources is becoming more costly with excess claim limits often as high, which is greater than the cost of even a top of the range of the e-resources. Security arrangements for existing systems should be reviewed, appropriate, practicable and improved. Apart from security buildings, other measures need to be adopted such as the use of security plates, and cables, disc drive locks and lockable storage cabinets to protect against opportunist thieves, vandals and general clumsiness. Although different measures to be needed for different circumstances, a general policy of adding in a security cost element for every machine purchased is necessary.

2.11 Flexibility in Hybrid Libraries

Library professionals are being asked to be flexible in the skills they acquire, in the services they offer, when they offer services and the organizational structures they establish to deliver these services. They are not alone in having to react to drivers for flexibility, as most areas of work and leisure have to display similar characteristics. At a global level, a complex mixture of social, technical, economic and political factors are combining to make flexibility a key attribute of the modern library.

2.11.1 Flexibility and Library Structure

Research library need to scrutinize their organizational structures in the light of the social, economic, environmental and technological changes which they face. There are number of factors which mean that libraries must remain flexible and ready to react
quickly, appropriately, particularly relating to funding, new working patterns and others.
The structure of library services has also been subject to a great deal of recent change,
with many factors implicated, including pressure on financial resources, changes in the
user base and in teaching, the widening access to information resources and increased
customer expectations. There were changes in accessibility, with the growth of non-
specialist end users, and changes in physical access, an example being Internet cafes.

The implications of the concept of flexibility in organizational structures were
daunting. It involved controlled development, seeing big picture, not developing services
in isolation, not reinventing the wheel, and no knee-jerk reactions. It involved constant
challenging and development of services, avoiding complicates and resting on laurels. It
was likely to involve dismantling of hierarchies into flatter structures, more partnership,
cooperation, convergence and multidisciplinary working. There were implications here
for contracts and pay scales, which, unless managed well, instill fear of change in
employees.

Fear of change was possibly the greatest barrier to achieving organizational
flexibility. Organizational change was not new but was accelerating. Library
professionals felt threatened both by the pace of change and also by changes to their
traditional roles and patterns of work. Issues of pay, status and training were recurrent
themes. In the hybrid library, fear of technological change was an additional barrier.
Traditional structures in academic institutions did not encourage integration of academic
and service departments. The problem of gaining the enthusiasm and commitment of
users is barrier which needs to come down to further the development of hybrid library.
Also, senior decision makers were felt lacking in comprehensions about such new
developments and consequently lacked a vision of what might be possible.

2.11.2 Flexibility and Library Professionals

Library professionals should accept that, flexibility is important because users of
hybrid libraries are diverse and have more expectations as the cost invested for services
is high and e-learning offer more promises. Library professionals are expected to supply
speedy services where increasing demands is reported with decreasing print resources.
Having a more self-sufficient user population is an obvious strategic advantage as well
as challenging. Distance users besides the normal users need to access to print and
electronic information. Increased user numbers mean flexible approaches to work and services must be developed. Research libraries at an organizational level are diversifying and becoming more flexible. Library professionals have recognized their role as supporters, advisors and counsellors in a hybrid library environment. At an individual level library professionals are also looking for flexibility in their working patterns such as part-time work and job sharing. With increasingly closer links with IT colleagues and recognition of the potential of ICT, library professionals see the need for multi-skilling which enables people to work in a variety of environments.

The demands for flexible hybrid library services are seen as having major implications for individual library professionals. They need to adapt and change priorities, where existing work is dropped in favour of new tasks. They have to share their skills with new colleagues and expect to learn new skills. Flexible procedures, which enable them to cope with diverse needs, must be developed. Close relations with academic and IT colleagues ensure a quality learning experience for the student. In turn, this can lead to situations where roles become blurred and unclear. The key role for library professionals is to be empower users through training. Work patterns are likely to become more flexible as 'out-of-hours' work and tele-working become more prevalent.

At a practical level, the drive for flexibility in Library professionals is interpreted in contrasting ways. Increased variety gained through flexibility may lead to increased job satisfaction which itself may result in more motivated staff who can provide a better service. This contrasts with the concerns over the rate of change and the stress attached to coping with turbulence. The complexity associated with developing flexible skills and flexible working is also seen as a source of information overhead. Library professionals need more support, monitoring and guidance to ease the path to increased flexibility.

A major barrier for library professionals is that users' expectations of a seamless, easy to use hybrid library may be too high. A further barrier is that insufficient resources are available to develop fully flexible library services. Some libraries lack the appropriate culture to support hybrid development. Internal competition for resources, lack of immediate benefits, and fear of change are significant barriers. Some library
professionals do not have the necessary skills and are not interested in acquiring them. If library professionals are to devote more time to such activities as the development of interfaces, they lose important contact with users. A further barrier is the tension between maintaining existing services whilst developing a new services in parallel. Management is identified as having a substantive role in overcoming their barriers. Special funding needs to be identified and budgets prioritized by management. Training programmes can be developed where library professionals are given the time and space to earn and adopt. Imaginative communication strategies need to be implemented across the institution, within teams and across teams. Management needs to take responsibility for selling the benefits of change and development in support of flexibility. LIS professionals need time to explore the drive for flexibility and what it means for them as individuals and their users.

Move to flexibility reduce the face-to-face contact with users. The speed of change is a worry, as is the blurring of traditional status and roles, which has been occurring. The high level of organizational change needed for effective flexible library services development is seen to marginalize some library professionals.

2.11.3 Flexibility and Library Users

Flexibility was considered important because of the nature of users and their evolving demands. Users were seen to have higher expectations, to be more aware of their rights as 'customers' and also more prepared to be vocal about their needs. Increasingly, users are combining their need with paid work and have more demands on their time. Learners are also increasingly studying in modes other than full-time, with part-time, distance and modular approaches growing in popularity. This flexibility in approaches to learning needs to be matched by flexible library services. With the concept of 24 X 7, users expect access to flexible library services whenever and wherever they need. With the introduction of course fees paid by learners, value for money becomes an issue. As individuals perceive that they are paying for library services, these must show evidence of quality and ensured of services to meet their varied needs. As users arrive at libraries with a wide range of ability, knowledge and confidence, library services need to be flexible enough to cope with this variety. There is also an increased awareness among users of the range of information available through new technology. Therefore library services need to be expanded, which can satisfy the
informed user as well as the less knowledgeable individual. In the competitive higher educational sector, libraries need to demonstrate the quality of research and service what they can expect, if they select their specific institution. Users should be offered more options to meet their needs.

There are a variety of implications for the hybrid library services related to users needs for flexibility. Users' demand for flexible services increases pressure on resources. If the use of printed information not decline whilst electronic information and services is to be continue to develop and to deliver. The needs of the users should be the principle driver in shaping flexible services; so detailed knowledge of their needs is vital. Investigations into user needs should be undertaken so that a proactive approach may be taken to the promotion of services. For instance, flexible loan periods for books may be incorporated. The increased flexibility in delivery (electronic v/s print) lead to the introduction of new services such as electronic document delivery. Users normally expect transparency between the different services. The move to 24 X 7 drive the demand for out of hours services such as electronic help desks, online guides, help lines and point of use instruction.

There are barriers likely to reduce the levels of flexibility needed by hybrid library users. Some barriers are universal and apply to all research library services. The copyright legislation limits flexibility at various levels. The contracts signed between individual library and electronic service providers introduce restrictions. A further sectorial barrier to users is the volume of authentication process and the resulting complexity where users suffer from 'password but-out'. Other barriers to flexibility are technology-based such as hardware with insufficient bandwidth capacity. The range of interfaces and their different appearances can also be overhelming and confusing to the user. When this is coupled with a high level of jargon, the hybrid library could appear impenetrable.

There are also some barriers that revolve around the users individual circumstances, such as lack of access to a networked PC or lack of appropriate skills to use hybrid library services effectively. Users may also have difficulty in allocating the necessary time needed to access services. Barriers within the control of individual libraries can also be present. It may be that insufficient resources are allocated for the
development of hybrid library services in terms of finance or staff time. There may be insufficient technical help services whilst maintaining traditional services could result in compromise. A research library may not have realized the need for hybrid delivery, but it results in a lack of managerial and professional determination.

In order to overcome these barriers for users, library professionals need to develop a wider skills base and become 'jack-of-all-tradesmen'. There was an overwhelming recognition for the need for more resources. Shared 24 hour help desks were becoming necessary - another key strategy related to learning about the customer of the hybrid library services through market research. Further need should be forecasted and anticipated. Mandatory user education should be considered.

2.12 Training

The manpower needs to be trained on the job to be at par with the organizations or countries where every job is carried out using information technological tools and techniques. The implementation of a good training scheme for improving the IT skills of staff can have a positive effect on morale and it is well known that minor improvements in the work environment can have a beneficial effect on staff productivity.

Good training in terms of IT means a threefold benefit to the services. Hence the increasing use of IT brings about three pronged changes in terms of:

- Front-line communication with readers can be of better quality.
- Teaching role of library staff can carry more authority.
- Communication between staff can be efficiently undertaken.

As per the Library Training Guides of Library Association, London, the essential elements for library trainers include:

- Presentation skills
- Interpersonal skills
- Basic computer skills
- Knowledge and basic understanding of different computer platforms
- Knowledge about e-mail registration
- An understanding of e-mail technology
- Internet search skills
- Web page creation and editing skills
- Experience of appropriate CD-ROM interfaces
- Experience of appropriate on-line databases interfaces
- Knowledge of personal bibliographical management packages
- Knowledge of access to on-line publications
- Course organization skills
- Assessment skills
- An understanding of learning techniques.

The front line library staffs such as staff providing referral services need to cover most of these topics. Their front-end aspects are important for reputation of library and information service. At the same time reputation of supporting services like acquisitions, cataloguing etc is also important. Therefore, good IT skills are essential in these areas as well. Staffs employed in supporting services units of the library and information centre also-need to have knowledge of how to access and use various IT products and tools. Some such IT products and tools as suggested by Library Training Guides, Library Association, London is:

- Suppliers on-line information
- Catalogue records
- On-line bibliographical databases
- CD-ROM database
- Internet services
- E-mail
- Appropriate software packages
- Digitization

Besides the staff with traditional library background need IT training to be offered in following topics as given by Library Association, London in its Library Training Guides.

- Networking technology
- Mail system administration
- Client-server management
- Web database management
- IT support management
2.13 IT Knowledge Staff

The present staff establishment should examine to see whether there is a need to formalize posts within the staff structure to meet the need for IT services in future. Many IT services have developed piecemeal, often promoted by enthusiasts, and may not have become fully integrated into the existing structure. There is a need to look at the existing establishment in terms of IT maintenance, management and development. Posts may need to create to meet the needs of the service in future. The impact of IT on some traditional jobs in the library such as cataloguing and acquisitions may lead to the creation of new and more integrated units.

2.14 Strategy for Future Development

The assessment of current strengths and weakness of the library service provides starting point for planning new developments. Any IT strategy needs to have a vision of where the service that provide in future, but with so many changes occurring in IT no strategy could be designed for many years ahead. Three to five years is maximum that one could expect any new system being installed now to last and for some it can be considerably shorter. A strategy must have the flexibility to adapt to change as it occurs and it must be regularly reviewed and altered to meet new challenges. The following developments should be considered for incorporation into research library IT strategy for the near future. The themes are not exclusive to research library but are possible elements in the IT strategies of all libraries.

2.14.1 Further Development of Computerized Catalogues

Although many research libraries have undertaken some degree of computerization of their issuing systems and created online lending catalogues, this process has not yet been exhausted. There are a number of developments that can be undertaken to extend and improve upon present facilities to provide a better service to library users.

- The introduction of self-issuing terminals at heavily used issuing points provides a faster service for users is an option.
- The provision of OPACs/Web based OPAC at all service points and in other relevant locations outside the library service is another. The introduction of more
intelligent interfaces using hypertext software similar to web browsers is likely to be a trend in future.

- The retrospective conversion of library catalogues; especially where this gives access to unique collections is essential if the full benefits of information technology are to be realized. Many local collections would be exploited nationally and internationally if they were made more accessible.

2.14.2 Network Development

Further development of the library’s computer network to provide access for users for more facilities is likely to be the main area for improvement.

- Increasing the number and range of CD-ROMs on the library network to meet the demands of users for fast retrieval of newspaper and periodical articles, access to directories and other works of reference.
- Improving the accessibility of the network in remote libraries with the aim of providing the same quality of information access at all sites.
- Providing access to network for external users, for example, officers and members in the local authority, to improve their access to information and to enable them to carry out research more effectively and more conveniently from their own terminals. This facility should be extended to all research libraries where links to satellite libraries operated by library services.

2.14.3 Multimedia

There is scope for the development of multimedia systems, initially stand-alone, eventually networked, to take advantage of the educational, research, entertainment, cultural and information facilities of multimedia devices.

- Provision of a range of multimedia workstations in libraries for library users. In particular, facilities for researcher to use multimedia CD-ROMs in the library should be introduced in all research libraries.
- Provision of multimedia CD-ROM’s for loan to users become more important as more titles are published and the number of home multimedia machines increases. This service should operate from the central library.
2.14.4 Access to the Internet and other Electronic Information Systems.

Access to external sources of information is becoming more necessary as library budgets diminish and as electronic sources of information become more interactive. The most obvious example of this is the Internet.

The provision of access for library users to external electronic information systems such as the internet is required either free or for a reasonable cost. If users who do not have access to such facilities at home are not to be disadvantaged, access should be available across the library network rather than at one isolated central point.

2.14.5 Remote Access to the Library

Users demand access to library facilities on same level as they are beginning to access other services, without restraints of geography. Many libraries, particularly those in academic institutions, have to provide remote access to their online catalogues either through Telnet or more recently through the WWW. Plans for this provision should be formulated in research libraries also.

- The development of remote access facilities in all libraries and will help users to gain access to information no matter where they reside.
- The development of facilities to allow users, especially for disabled and housebound, to access the library network from their own homes.
- The provision of direct access to the library catalogue and other facilities on the library network for mobile libraries.

2.14.6 Electronic Information Provision

Libraries have many unique resources, which could be made available to more people other than those who presently travel in to central or district libraries to access the physical stock. These resources could be exploited further if they were duplicated in electronic form and made available over networks.

The library's role is developing as an information provider by making electronic information available for downloading directly from the library's own services, including electronic text, images and shareware both locally and via Internet. For example, many library services have local studies collections including unique text and photographs.
The retrieval of photographs in particular is often difficult and time consuming from the point of view both of identification and of what is required and its physical retrieval from remote storage. Conversion of the photographs to a digitized format together with an automated cataloguing and enquiry facility would enable staff and users to have a speedy access to any individual photograph and to obtain a laser printed copy whenever required. Nationally, these unique resources could make more widely available through electronic networks. The process of digitization of unique text and images has to consider as part of the long term IT strategy.

- The production of information pages, especially community information, for the World Wide Web to make them accessible on the Internet either through a corporate server, web server of the library.
- Working towards providing 24 hours access to electronic information should be the goal of all research library services.

2.14.7 User Access Computers

Access to information is not available to a significant number of people in the future, if the costs of equipment, software and line charges are too high. Research libraries must provide terminals that are accessible at free of cost or cheap to use to counteract this advantage.

- The provision of computers for use by the user with a range of popular software such as Word processing, Spreadsheets, Photoshop, CorelDraw, Dream weaver etc. This service naturally becomes very popular.
- The provision of e-mail and bulletin board facilities would allow library users to communicate with staff and with remote users.
- The provision of facilities for open learning and other forms of self-education/research utilizing Information Technology.

2.14.8 Broadband Telecommunications

Telecommunications and cable companies on the main information superhighway infrastructure at the moment are active and most of this will be in place near by the years. Research libraries need to think about how they can take advantage of this communications infrastructure both locally and nationally. Opportunities for co-operation with local libraries and other organizations multiply the future as more and more become wired up.
• The development of policies for adopting future facilities in broadband telecommunications and cable systems for the benefit of library users is important.

• The investigations of the potential ISDN, ATM and cable for the transmission of information from library to users. In particular to look at developing systems in conjunction with the local authority’s policy.

2.14.9 IT Skills for Library Professionals

Plans need to be formulated to prepare staff for the sort of services that is to be introduced in the next few years. IT training is likely to absorb a greater proportion of the training budget in future and size of training budget is need to be considered. IT training is often expensive and needs to look on more co-operative basis. Training is essential but also there is a need to review job descriptions and person specifications for many posts in library service. The creation of new posts needed for the developments of new electronic systems must also be taken into consideration, including network managers, software specialists and programmers, IT maintenance and support staff.

• The improvement of the IT skills of staff to meet increased need for IT developments in library service.

• The provision of more training in basic IT skills and general software such as word processing to provide the IT based library service.

• Training staff to help library users make most of IT equipment in the library service, including the use of software packages and information retrieval systems.

• Increasing staff awareness on new technology and systems such as multimedia, Internet etc.

• The introduction of an IT component into all job descriptions for library professionals.

• Introducing new posts into the establishments that are dedicated to development of IT systems and services.

2.14.10 Improvements in Management Efficiency

Management efficiency can be significantly improved by making full use of desktop computer facilities for the creation, storage and transmission of documents.
• The standardization of word processing input so that text can be distributed on
  the network or on disk as required.
• The storage of documents on a network server for access by manager from their
  own terminals.
• The storage of management information such as detailed performance statistics
  on a network server for retrieval by managers.
• The integration of the flow of text for word-processing, desktop publishing etc., so
  that several products can be produced from one body of text.
• The use of e-mail, fax and information retrieval software to improve group and
  project working.
• The use of IT to extend and improve the marketing and publicity of library
  services by making full use of DTP and other facilities.

2.14.11 Consortia

Networking is a co-operative process and it become increasingly important in
coming years. Libraries no longer are isolated from each other or from their users, as
universal access become increasingly possible.

• The development of co-operative partnerships with other research library
  services either by locally, nationally or internationally with a view to joint
  development and exploitation of electronic networking.
• The developments of joint project with neighbouring library services in the filed of
  electronic networking for the mutual benefit of library users in the area.
• The development of consortia with other local information providers to improve
  access to electronic information at local level.
• The development of joint projects with existing library co-operatives on a national
  basis and co-operation with any national initiatives designed to further the role of
  research libraries in information superhighway.
• The formation of partnerships with other Indian research libraries to bid for
  funding from India for the development of improved library services.

2.14.12 Virtual Private Network (VPN)

Virtual private network is the private network of library; where only a restricted
library staff or users can use it. It is virtual network because, there is no physical
connection connecting the nodes of network. The network is built by establishing virtual
connections over a public network like Internet. A VPN set up generally has two components one is the VPN gateway that has to be set up at library site and other is the VPN client. The VPN gateway is combination of hardware & software. Each LAN have it's own VPN gateway. When two LAN's have to be connected, a tunnel is created between the gateways and the data is transferred. A VPN protocol is used to transmit the pocket through Internet. The main function of this protocol is used to encrypt the data and tunnel it through Internet. Example PPTP (Point to Point Tunneling Protocol) is an extended version of the dial up protocol PPP, to provide support for VPN. This VPN definitely helpful to the library users in accessing sources and services of the library, who are staying out side the campus.


Research institutes in India play a major role in generation and dissemination of knowledge by conducting research works and producing more technical reports, projects and thesis as a unique genre of information sources. These works contain valuable content including focused literature reviews and details on research, which are not made generally elsewhere. At the moment, most unpublished technical reports; projects and gray literature are hard to get hold of, as they are file only in the library where the researcher has worked. These problems were addressed already and serious attempts have been made to solve them. Electronic reports, projects and thesis (ERPT) of digital libraries offer an alternative to this waste of valuable scholarship. In addition, they offer researchers new opportunities to explore the possibilities electronic writing offers for developing new genres of research scholarship.

Electronic reports, projects and thesis or ERPTs are defined as those reports, projects and thesis submitted, archived or accessed primarily in electronic formats. That includes traditional word-processed (or typewritten and scanned) documents made available in PDF, as well as less traditional hypertext and multimedia formats published electronically on CD-ROM or on the World Wide Web.

Electronic reports, projects and thesis (ERPT) are an evolving genre of research literature that is gaining widespread acceptance among research institutes in the international community. An ERPT is a document that explains the research or
scholarship of a researcher. It is expressed in a form simultaneously suitable for machine archives and worldwide retrieval. The ERPT is similar to its paper predecessor. It has figures, tables, footnotes and references. It has a title page with author’s name, official name of research institute, the degree sought, and names of the guide. It also documents the author’s years of academic commitment. IT describes why the work was done, how research relates to previous work as recorded in the literature, the research methods used, the results, interpretation and discussion of the results, and a summary with conclusions. The ERPT is different, however, it provides a technologically advanced medium for expressing your ideas. ERPTs evolved with digital libraries and many research institutions in the world treat it as an important component of their digital libraries.

2.14.14 Implications for key Corporate Policies

There are many ways in which the library’s IT strategy can contribute to the local authority’s policies. The following key areas are examples.

2.14.1 Equal Opportunities

The IT strategy should designed to improve access to library services to all users, particularly to disadvantaged users. In the long term, remote access to library services from the homes of individuals can be of direct benefit to the disabled. Access to services beyond the normal library opening hours enable more people to take advantage of services who cannot do so at present because of work or other commitments.

2.14.2 Economic Disadvantage

The IT strategy should designed to provide improved access to information at all the service points in the library, so that it can be extended to provide similar facilities in research libraries, including the provision of public access terminals either free of charge or for a minimum cost. This is intended to ensure that users do not have to make expensive journeys to gain access to information and those who can not afford to have terminals at their home.

2.14.3 Environmental Implications

By providing remote access to some library services in future, some reduction in the number of journey into city centers and elsewhere might be achieved. In longer
term, the increasing use of electronic systems might lead to a decrease in the amount of paper consumed for print based media.

2.14.18 Support for Conferences/ Workshops

The strategy should design to make access to information easier for the growing number of users who in future attend the conferences/workshops. More information should available about conferences/workshops opportunities through online services such as the Internet that help people in applying for conferences/workshops in future. Research libraries have a role to play in helping people in the future who need easy access to information as part of their work.

2.14.19 IT Strategy Integration

The developments of the IT strategy were produced in a coherent document for wider dissemination. Support by library's management team is essential and time devoted to examining and amending draft strategy to meet all the needs of service. Other council officers should submit the strategy for approval with an overview of corporate IT policies and to council members who endorsed it. The document was distributed to all staff in the services so that they were aware of the plans for future. The IT strategy was integrated into the general service plan of the research libraries, since much development depends on capital financing there was a need to ensure that bids were prepared for forthcoming capital programmes. The importance and strengths of strategy should be indicated for IT development in library service in coming years, which allow the introduction of a wide range of services to users.

2.15 Final words on IT Strategy for libraries

Not all library services are able to implement such a wide range of IT facilities. Many authorities may find difficulty in funding the investment needed. The trend towards end-user and consumer access to electronic networks puts research libraries with their direct service provision to the users at forefront of authority development of IT services. The production of a comprehensive IT strategy is a vital part of the process of gaining recognition for that role. The library authorities should be committed to implementing an IT strategy as part of its development of library services as a whole. The strategy has already had a significant impact on the improvement of services provided for library users. New services are being introduced as resources become available. Electronic
services are not intended to replace traditional media but to complement them. By providing such research libraries services continue to play a vital role in the provision of information services.

References:

