CHAPTER VI
Management Information Systems in Libraries.
The contemporary approach casts academic librarians as managers within the higher education system. Planning and controlling development is clearly an important aspect of that role. Academic libraries' objectives have become clearer than in the past, but British academic libraries' attempts to achieve those objectives have been threatened by government financial policies which, in effect, require academic libraries to provide more and better services with less money. Consequently, every aspect of academic libraries' operations has to be reviewed so that they can be managed more effectively and efficiently. It is not easy to achieve this because academic libraries are complex organisations.

What academic librarians need, now much more than ever before, is the information which will allow them to plan properly, to know whether or not the library service is meeting the needs of the academic community and to be able to demonstrate that to the internal and external authorities responsible for funding. Performance measures are also necessary in order to reveal libraries' strengths and weaknesses when compared with internal and external targets, norms and averages.

The introduction of computers into academic libraries was largely a response to the problem of dealing with increased workloads with fewer staff, and they are now able easily to handle most of the routine and repetitive work of the library staff. In addition, they have the capability to
enhance the provision of management information, since automated data processing is able to present reports more accurately and much faster than manual systems. A limited range of data processing for management information is currently supported by the computer systems, including microcomputers, available in academic libraries, but there are still significant weaknesses in library automation systems in respect of the production of management information. For example, much remains to be done in monitoring high cost areas such as serials management and staff deployment in reader services. Consequently, apart from the one library visited which has a decision support system, current library automation systems are not fully used for formal management information systems. It has to be said that most librarians still consider the continuous costs of automation as a worrying expense, and that the development of management information systems is not seen as a high priority compared with the introduction or upgrading of new automation systems for handling routine operations.

Nonetheless, most librarians claim that they would now like to install decision support systems, even though they see the expense as a problem. The likelihood of increasing requirements for information to be provided at institutional level to meet government demands that institutions should be accountable may change priorities and foster developments. While waiting for these developments, and for this new technology to be proved, attempts must be made to find out whether
there will be support for the establishment of management information systems or decision support systems, and in particular, whether there will be support from the parent institutions and the library staff. The introduction of automated management information systems seems unlikely to pose a threat to staff in academic libraries, as most already have a ‘flat’ management structure, but a priority must be training programmes on the use of information in management. Support from parent institutions is also essential since the technology required for decision support systems could be expensive, particularly if they are seen as separate from the replacement of the libraries’ existing automated systems. Living in an age of such information explosion, Management Information Systems (MIS) have emerged as a solution to this capacity expansion requirement of Academic Libraries.

According to McClure (1990), Management information systems are tools designed to improve management decisions. The MIS’s function is to provide library Staff and Readers with data, information, analysis and tools that enhance the effectiveness and efficiency of library services and assist in the decision-making process.

The objectives of an MIS are to assist staff with the daily decision making process, to maintain better accountability and control of resources, to monitor budget allocations, to improve overall library effectiveness by focusing on outcomes to generate internal and external
reports to improve long-term planning and to facilitate performance measures activities. Further, the MIS intervention offers utility to Readers too by means of a wider bibliographic database through e-resources.

However, like all development tools, the development of Management Information Systems too carries certain inherent barriers. There were several reasons why many of the libraries find it difficult to implement the Management Information Systems. The criteria of an ideal Management Information System are that they must be inexpensive to operate, that they must strengthen and consolidate not overrule the existing conventional Library Management Services, and that the development of staff competence is a major prerequisite.

MIS is the need of hour; a necessity for all libraries with a large customer base. Delivering quality service in a period of scarce resources and constant technological change means that libraries need organizational cultures that support lifelong learning, system thinking, innovation and community building.

The present study is therefore an attempt to propose collaborative partnership with neighboring university libraries of Chhattisgarh in order to make better use of common resources and to improve services to Readers. The Study offers a software as the tool to enable such
collaborative working. However offering any tool to facilitate Library operations shall be incomplete until it bears a strong Customer focus.

A management information system (MIS) is a subset of the overall internal controls covering the application of people, documents, technologies, and procedures. According to McClure (1990), Management information systems are tools designed to improve management decisions.

The terms MIS and information system are often confused. Information systems include systems that are not intended for decision making. The area of study called MIS is sometimes referred to, in a restrictive sense, as information technology management. That area of study should not be confused with computer science. IT service management is a practitioner-focused discipline. MIS has also some differences with Enterprise Resource Planning (ERP) as ERP incorporates elements that are not necessarily focused on decision support.

Therefore Management information systems are distinct from regular information systems as they are used to analyze other information systems applied in operational activities in the organization. Academically, the term is commonly used to refer to the group of
information management methods tied to the automation or support of human decision making, e.g. Decision Support Systems, Expert systems, and Executive information systems (O’Brien, 1999).

Consequently, the potential of Management Information Systems has lain hidden. By the late 1980s, however, most academic libraries in the United Kingdom had computerized the main library operations. The first part of this discussion considers the growing importance of a formal planning process in library management. Next it discusses the relationship of the library planning process and Management Information Systems, and describes how computer systems can be used as a tool to produce management information. It then goes on to review the development of automated library systems.

The higher education sector in Britain comprises universities established over the last seven hundred years, including a number designated during the last phase of expansion in the mid-1960s, and those institutions which were mostly redesignated as universities in 1992 - the Polytechnics and their Scottish equivalents, the Central Institutions, as well as certain Colleges of Higher Education.

The expansionary momentum of the 1960s and 1970s was followed by pressure for efficiency and economies. The 1980s was not a period in which academic libraries prospered. The political and economic situation
became difficult for all higher education institutions. The University of Sussex, for instance, and its funding reduced by 20 per cent between 1981 and 1984, and is now facing a further reduction by 1990.'

This was usually followed by a reduction in financial support for their libraries. Nonetheless, some found this environment a beneficial challenge. Mackenzie observed that: 'it may be that a measure of austerity is beneficial in that it encourages creative thought and more effective management.'

In particular, academic library managers needed to use a more formal planning process to focus their services on meeting users' needs. Sparrow illustrated the planning process as: (1) Establishing overall objectives (2) Allocating library resources to programmes (3) Evaluating attainment of objectives.

According to McClure, in the times of economic difficulties for many academic libraries, the need for a planning process takes on significant importance in six general areas. First, planning provides for a rational response to uncertainty and change. Although the organisation cannot control its environment, it may be able to manipulate it - assuming there is an objective to be accomplished. Second, planning focuses attention on goals and objectives. Does your organisation have a written set of goals and objectives? If not, dysfunctions, departmental competition, and
ineffective resource allocation are likely. Third, planning is important as an aid to resource allocation by establishing priorities for funding. Which services can be provided at the least cost and for the most benefit?

Fourth, planning also serves as a basis for determining individual, departmental, organisational, or program accountability. Fifth, planning facilitates control of organisational operations by collecting information to evaluate the various programs or services. Finally, planning orients the organisation to a futuristic stance. Instead of always reacting to problem situations, the organisation attempts to foresee and mitigate against future problems before they become crises. Sparrow also emphasised that 'Precise and consistent objectives provide guidance and direction for managers to develop plans ... for allocating resources in line with objectives and ... for monitoring and controlling these resources.

At the institutional level, all academic library managers must negotiate the library’s resource requirements through various supervisory committees. To support their claims, academic librarians clearly need information which can be presented to these committees about how effectively the libraries contribute to the objectives of the parent institutions.

'Libraries are required now to develop services which can be targeted at different groups based on their own needs. The changing demography of higher education argues for a careful and continuing
monitoring of such factors as the profile of the student population, measurement of library use by identified subgroups and experimentation with new services and assessment of their impact.

Information needs and performance measurement are another feature that implementation of MIS provides to the libraries. Information which is reliable, accurate, timely and well presented will always help library managers to make decisions. Moreover systematic procedures are needed for allocating resources in line with objectives and ways must be found for monitoring and controlling these resources.

Performance assessment is the systematic measurement of the extent to which a library has achieved its objectives in a certain period of time. Performance assessment can be applied in libraries, in the contemporary British terminology, to: service input cost measures, service output measures, service effectiveness measures, and service domain measures. Internally, performance assessment is concerned with making the library work efficiently and effectively. Externally, it can be used by library managers to justify the budget to the parent body.

Without performance assessment it is difficult to determine how well the library is progressing. The term 'performance assessment' encompasses both performance indicator and performance measure. The implementation of performance assessment in academic libraries, is an
essential part of good management practice. Although she had reservations about the current Management Information Systems in university libraries because, for example, few academic libraries had produced a statement of their objectives, she still believed that Management Information Systems could contribute to effective management of library activities.

The four main objectives for Management Information systems have been defined as: (1) to facilitate the decision making process in the library by providing the managers with accurate, timely, and selective information that assists them in determining a specific course of action. (2) to provide for the objective performance measurement and assessment of selected relevant areas of the library. The areas are to be determined during strategic planning. (3) to provide pertinent information about the library’s internal and external environment and, (4) to provide information on alternative strategies and contingency plans.

The purposes above can only be implemented if people look upon Management Information Systems as an integral part of the framework of management in the academic library and not as a peripheral system which has been installed for the benefit of an individual or a single department.
There may be subsystems within the larger system, which may be branch libraries, or departmental divisions such as cataloguing, acquisitions or circulation, but they must still be seen as integrated parts of the whole, and must function as such ... In the systems approach, however, the library organisation must be seen as an organic whole, with information as its lifeblood and in which each part of the system is integrated by the flow of information throughout.' 36

An integrated Management Information System is very important because it can be used to provide supporting information to determine: (1) efficiency; is the library doing things right? (2) effectiveness: is the library doing the right things? (3) competitiveness: is the library heading in a direction which is consistent with the environment (that is, does the library have a strategy, and is it certain that it is the correct one)?

Any discussion of the Management Information System must lead to consideration of the inputs data, processing data and the outputs data. Inputs to the management information system consist of both internally and externally generated library data. External information covers factors such as legislation, politics, trends in society, and changes in technology, user demand, and comparative statistics for other, similar institutions. Internal data is that derived from administrative routines and transactional information. Administrative routines include those related to personnel, finance, acquisition, cataloguing, processing of materials, binding, building services, maintenance services, etc. Output measures will include
data of circulation, general user satisfaction, etc. All service points will need to be monitored so that internal performance comparisons can be made and the contribution of each service point are the overall objectives of the organisation assessed.

In term of library managers’ needs, a variety of inputs is evidently needed. It may be necessary to process information in different ways for different levels of decision-making needs, and different types of output reports will be needed to meet those different needs. Selection of appropriate data elements for inclusion in a Management Information System assumes that: (1) clear goals and measurable objectives have been developed for the library, (2) for each data element there is rationale for how it will be used or in what combinations with other data elements it can be used to determine success toward the accomplishment of objectives, overall library effectiveness, or performance measures for specific library services/operations, and (3) the library can, in fact, collect reliable and valid data for a particular data element.

The data in a management information system also needs to be processed to turn it into meaningful information for library management. For this reason, management information systems require an appropriate data processing system. Data processing, according to Hicks,39 is the
capture, storage and processing of data for the purpose of transforming it into information useful for decision making.

In recent years, data processing for management information systems in business and industry has increasingly been undertaken by computers. A modern MIS will always rely to some extent on computer technology, although a computer is not a requirement. The reality of the 1980's would indicate that a computer is a necessity for the most sophisticated systems.

In libraries, in contrast, the development of the use of computer has been:‘modular, in the sense that it is based on a single library operation such as acquisitions, serials, control or cataloguing. The more general applications of management information lay hidden, as it is often seen only as a departmental resource.

This need not necessarily have been so. An early prediction of the advantages of information produced by computers was made in 1979 by Tague, who suggested that computers should produce information for control at both macro and micro level in libraries.42 However, in 1986, Brophy, having analysed eight large computer systems used in British libraries, noted that automated library systems seem to be primarily about control at the micro level.
Moreover, they produced management information which was relatively crude, highly structured and very much a system by-product. The needs of individual managers tended to be overlooked, especially when the design of MIS was in the hands of computer personnel. Too often, management information has been produced as an afterthought following computerisation. Most computerised issue systems, for example, were never designed to produce management information although librarians have often struggled over the data generated by these systems in an attempt to derive some meaningful information about issue patterns.

Technological changes have helped to ease this problem. As opposed to the use of mainframe and mini-computers, the advent of the microcomputer now provides an alternative to the dependence on large-scale centralised computer systems. Computer power can now be deployed cheaply to different parts of an organisation to allow for local processing of data.

Computers should be easily able to provide four types of report: periodic reports, exception reports, on demand reports, and predictive reports.47 Periodic reports provide routine, statistical information in detailed or summarised form. Exception reports highlight areas requiring managerial attention and would focus on those that have been overlooked. On demand reports provide a response to a particular non-
standard question. Predictive reports give forecasts and provide comparisons based on statistical manipulation of data.

The principal requirement of the outputs of academic library management information systems is that they should be of interest to: (1) the relevant committee - the members wish to know how the library service is performing and whether the institution, is getting value for money. (2) the chief financial officer - his role is primarily custodial, and he wants to be assured that there is no overspending and that money is used for the purpose intended. (3) the chief librarian - who wants to know how services under his control are performing in accordance with plans, targets and budgets. (4) the managers of individual sections or services - who want to have data on the operations and performance with plans, targets and budgets. (5) outside organisations requesting library performance data on a regular basis (for example, the Funding Councils, or the Standing Conference of National and University Libraries – SCONUL).

In these ways, the outputs of management information systems become information for decision making. In general, management information is: ‘the right information in the right form at the right time, so enabling the manager effectively and efficiently to do his/her job.'
The value or quality of management information is determined by three factors. They are: (1) the content of information: information is the substance of communication, but to be information rather than data or noise, it must be meaningful, relevant and new to the receiver. (2) the form or presentation of the information: Information should be presented in a style and format readily understandable by the manager. This means that the producer of information must be aware of the recipient's knowledge of technical terms, numeric / literacy levels, his individual characteristics, the characteristics of the group with which he works and so on. These and other factors help the information producer to form an idea of the perception level of the manager and increase the likelihood of producing understandable information capable of being used which, it will be recalled, is the only way information can create value. (3) the timing of its presentation: Information which is produced must be communicated to the manager in time to be used. Delays in data gathering, processing or communication can transform potentially vital information into worthless waste paper.

In the planning process, information should support the decision making process. Since one of the major problems facing academic libraries is the impact of changes in available financial support, the Colleges of Further and Higher Education Group (CoFHE) of the Library Association has been considering the categories of management
information required for making decisions concerning the budget. They concluded that these are: (1) information about the institutional identity of the library (2) information about the target group (3) information about the collection resources (4) information about the financial resources (5) information about library personnel (6) information about facilities and equipment (7) information about various programmes and functions.

Considering the requirements for collecting management information, (1) The information sought must be worth the costs of collecting it - direct and indirect. (2) To consider sources of information already available within the institution before setting up mechanisms to collect it. (3) To keep the collection of information relevant, i.e. remember the purpose - ‘to support the budget request and (4) To remember to consider qualitative and quantitative data as both can be relevant.

Adams identified five major problem areas of management information systems. As (1) Output is undiscriminating (2) The information is not analysed for a purpose (3) The data lacks integration (4) The system is not user-friendly (5) The information which is given by MIS may not be acceptable. To overcome these problems, Adams and his colleagues at De Montfort University (formerly Leicester Polytechnic) have experimented with a decision support system.
A 'Decision support systems can be seen as an extension of the idea of management information systems to provide a wide range of information in a more flexible and interactive way. They are designed to support decision making needs of management rather than act a useful by-product of transaction processing systems.' The special feature of a decision support system is that it solves a major problem of management information systems, i.e. the poor communication between the system and the users, library managers. Decision support systems have interface outputs which are more live than those of management information systems. The main interfaces in decision support systems are: (1) Regular reports which provide information on parts of the system, which are predetermined by the system’s users. (2) Event-centred reports in which a report is generated only when a predetermined event has occurred. This will usually be the result of an exceptional condition, which is signalled by the system. (3) Ad-hoc reports which are generated in response to a stimulus by the system user to report on a condition which is not normally monitored. (4) A query language which enables the user to interface directly with the system and to test changes in conditions experimentally. This is usually performed with 'goal-seeking' and 'what if techniques.

Beside the interface output, a decision support system also provides the report formats which may be required by the system’s user, ranging from simple one-off designs to sophisticated presentations for senior managers. They are: (1) Standard reports containing details prompted by
the system user but in a format determined by standard software. (2) Tailored reports containing information determined by the user and in a format designed by the user. (3) Tabulations enabling the user to examine a range of statistical data rapidly, in either a standard or tailored format. (4) Spreadsheet format allowing the user to transfer data from the system into a separate format which can be manipulated in a statistical layout. (5) Graphic presentations providing a method of transmitting a trend analysis rapidly, and in a user-friendly manner.

Like management information systems, the data input into decision support systems can be external or internal data concerning the library. Adams has confirmed that three levels of influence on decision making can be isolated: (1) Information from the library’s operations (2) Information from the parent organisation (3) Information at the national and regional level.

The differences between a management information system and a decision support system lay not only their features, but also in their users. Management information systems tend to be used by lower and middle management because of their ability to assist in making structured decisions. In contrast, decision support systems tend to be more useful to top management because they can help with decisions on unstructured issues. Where they exist, decision support systems appear to be mainly used at the strategic management level.
However, despite the widespread benefits that the management information systems offer, they carry some inherent barriers too. There were several reasons why many of the libraries visited lacked management information systems. The criteria of an ideal management information system are that: (1) they must be inexpensive to operate (2) they must not interfere with existing services (3) they must provide reproducible results.

The fact that some libraries claimed to have only 'informal' or 'partial' management information systems or to have no management information systems does not mean that they had no collection of external and internal data. They do collect and use information for establishing library objectives and priorities or for resources allocation, but they have not formalized their management information systems, typically because their institutions had not required them to do so. Organizational commitment therefore stands as major prerequisite for successful implementation of MIS in university libraries.