Chapter 6

PLANNING
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6.1 INTRODUCTION

Planning is an important component of library automation in order to have effectiveness and economy. Preparation is the first step of planning process. A planning group has to be constituted to oversee planning and implementation.

The work involved in planning can be divided mainly into three steps, namely definition of objectives; feasibility study; and redefinition and design. Several aspects of automation involved at each step are discussed in this chapter.

Automation envisages an excellent opportunity to introduce additional facilities and improve the existing services in the library. It can be applied to every function of the library routine or operation. Libraries have already observed that automation has changed the image and contributed for achievement of its objectives. It even provides an atmosphere in which the level of users’ satisfaction increases.

University library services in developing countries such as India are not as efficient as in the UK or USA due to limitation of resources. Even documentary resources are under-utilized. The number and type of services rendered are very limited and the managers are in a helpless situation.

Automation in these libraries may improve the existing scenario and may contribute to an increased use of documentary resources. Automation is considered by these libraries as an important tool to overcome several constraints.

The concept of automation has been well received by the university libraries in developing countries, but the libraries are not in a position to implement the automation due to a number of reasons. Automation is a complicated procedure and it is neither like shifting from one house to another nor like changing a job. It has an impact on every aspect of a library's operations / functions. Before considering the introduction of automation, it is necessary to examine such implications, as financial commitment, staff training and availability of infrastructure.
It is also true that automation cannot be implemented at one stroke. There is a need to put in a lot of effort, and it is essential to have good planning for effectiveness and economy in automation. The automation procedure is divided into several steps. For instance, Tedd (1984) identifies mainly three steps. They are Feasibility study; Analysis, Design and Specification; and Implementation. Rowley (1986) adds another three steps for library automation, as follows:

Definition of objectives;
Feasibility study;
Definition phase;
Design phase;
Implementation phase; and Evaluation.

Planning for Automation

- Needs mapping
- Best possible package
- Staff Involvement
- Budget (Purchase, operation, maintenance, etc.)
- Hardware Requirement (Client/Server, Printers, etc)
- Platform (Operating System)
- User awareness
- Maintenance

Different factors have been examined for necessary actions at every step. There the decisions and actions of each step have to be studied. All these steps can be regrouped into two broad headings, namely Planning; and Implementation.

Next, it is necessary to identify the steps to be examined under each broad heading. Thus, Planning consists of Definition of objectives; Feasibility study; and Definition and Design. Implementation includes Implementation; and Evaluation.

Prior to planning, sanction for automation has to be obtained from the authorities concerned and this may be known as preparation. Preparation for automation has its Relevance and value in the context of developing countries. In the following sections, Preparation for planning is discussed.
6.2 PREPARATION

Every University library intends to automate its functions. The desire of librarian(s) will not produce any positive result unless the required resources are mobilized.

To fulfill the desire a librarian has to get

- Management acceptance;
- Staff acceptance;
- Users' acceptance; and
- Sanction of finances.

These aspects are examined below.

6.2.1 Management Acceptance

The librarian may be aware of the benefits and implications of automation, but his awareness does not create support for getting finances. He has to create awareness among his staff, users and authorities. Their awareness may provide support in getting the project implemented. It may be true that the authorities may also be aware of the project's importance and need, but their acceptance implies sanction of huge amounts of finances for the project.

The library has to prepare a report on automation of the university library system and in this report, details such as impact of automation, how the services will improve, in what way benefits will be created, how it will help in achieving the objectives, how the staff deficiency can be compensated, what additional services can be introduced and the approximate financial requirements have to be included. Submission of the report may not immediately create a conducive atmosphere for the sanction of the project. The library has to lobby with the academics and administrators to get the project sanctioned and relations with them may have to be exploited. Besides the library has to pursue the Authorities continuously till necessary resources are obtained.
All these efforts may put undue pressure on the management to give clearance and sanction of necessary finances. If the university cannot allocate all the finances from its budget, at least part of it will be allocated. The university may also ask the library to go ahead with the project in two or three stages within a period of 2 or 3 years. The remaining part of finances can be obtained from different funding agencies, such as University Grants Commission (UGC), DST, AICTE and the State Government.

If the university intends to allocate the finances as it is evident in many cases, the management can allocate the finances. Everything depends on how much the management is committed to the project of automation.

Gujarat state University Library and College libraries have stated that the management will support the automation plans. This is the observation made by the managers of these libraries. But mere acceptance may not help in getting required finances. For instance, the Principal of BMC strongly supported the cause for automation, as he had the opportunity to use and understand the benefits of automated library systems in the West. Two more principals also supported automation, hoping that the functioning of the library may improve substantially.

For 1993, as part of Platinum Jubilee Celebrations, the university has planned several programmers. The library managers and the university administrators have shown keen interest in automation of library functions. The Principals of the Campus Colleges were critical of the present system and suggested the use of computers in libraries to improve the existing system.

Automation of university library is one of the targeted programs. At present, the Gujarat state University’s library have already acquired one each PC/XT each. Some of the professionals have also been deputed to undergo training. One library professional and one computer technician are being sent to INFLIBNET centre, Ahmedabad, for training. All these developments clearly indicate the management's commitment for automation of University’s and it is likely to be extended to other
colleges. The acceptance and Commitment of the management goes a long way in Automation.

Now the UGC has selected ten university libraries for automation in first phase under INFLIBNET project and Gujarat grant in all University is one among them. Gets all the support from UGC and management for automation.

### 6.2.2 Staff Acceptance

University and college libraries have to create awareness about the benefits of automation among their staff. The staff has to know how the library can improve its services and image by automating its functions. They have to be taken into confidence and have to be informed about the development from time to time.

Their acceptance provides lot of support to library authorities. A phobia, prevalent in developing countries like India is that automation may make most staff redundant. Therefore, the staff, generally supported by their unions, creates an unfavorable atmosphere to get clearance. In India, staff redundancy is not always legally sanctioned.

And at the same time the staff is also aware of the value of Information Technology (IT). It will -be easy therefore for the library authorities to get the acceptance of the staff, and this will give moral support and strength for getting the automation project sanctioned.

In the field survey and personal interviews, the managers of Gujarat state university’s library Automation indicated that the staff would welcome automation. 130 professionals favored for automation. Even 140 semi-professionals and non-professionals also supported the cause of automation. Only one semi-professional expressed his reservation stating that automation would affect the employment potential and career prospects. On being explained the benefits he too fell in line with "the others. The favorable attitude of the staff is due to the general awareness
regarding the advantages of computer use. Their acceptance is a favorable factors for the automation the Gujarat state university libraries.
6.2.3 Users' Acceptance

The users of every library expect efficient services in support of meeting their informational needs. It is more so in the case of academic and special libraries as most of them need nascent micro thought. It has been observed and proved that the manual operations do not create a congenial atmosphere for the libraries to provide such services. The users have either used or known the benefits of the computer, Services. In the field survey it was found that their attitude is generally favorable to automation.

The teachers (260), research scholars (320) and PG Students (420) have expressed their support for automation. Especially those teachers who had used the automated systems in the West have emphasized the urgent need for automation. They stated that automation will improve the present library environment and may be they are the immediate beneficiaries.

It has been observed that in Gujarat state university libraries, the management, the staff and the users expressed their support and they would like to derive benefits from improved library services. It is possible that a few individuals may oppose automation, but it is necessary for the library to explain the benefits which are likely to be derived by library administration and management from automation along with services. The university had already initiated the use of computers in laboratories, offices and this was never opposed by the unions and there will be no different attitude towards library automation.
6.2.4 Finances

Management acceptance leads to sanction of required finances. The sanctions may be either in one or more installment sanction will be the first achievement of the library to automate its services. After getting the sanction, the library can go ahead with planning and start the process of automation. Prior to planning it is necessary for the planners to take into consideration the impact of automation on operations, staff access to information, services and costs.

Corbin (1988:10-12) for example, has clearly indicated that many changes should or will take place in a function, when it is automated. However a few aspects of an existing function will remain unaffected. The changes may transform the non-automated function into an entirely new, more effective and efficient function, which can provide better service to its users. Corbin further states that the impact of automation on a function will also extend to effect on operations; staffing; access to files; organizational and management structure; and services and costs. The may be elaborated as follows.

Operations: Operations will be different, more complex and require more precision in their execution in an automated function. Smooth interaction is required to avoid errors and delays in automated operations. Staffing: Automation may result in reduction of staff for a specific operation/activity. The Excess staff may have to be shifted to other programmes/functions. It is necessary to Restructure the jobs and reassign duties for all the staff. All the staff requires re-training and re-orientation to operate the new automated systems.

Access to files: The files which are located at one place can be made accessible at many places as the files are under computer control. The files can be made available to any staff or user who has an access to the computer terminal. This will break the departmental barriers and promote inter-departmental relations.
Organizational and management structure: Automation results in new and better organizational structure paving the way for new and changed relationships between the functions.

Services: Automation facilitates provision of improvised services as it is capable of performing repetitive and routine work in a faster and accurate way. The computer also provides to new services and can also take an increased amount of work.
Cost: Automation will no doubt be expensive but it provides efficient and extended services and increased work output.

To study the impact of automation and prepare the automation project, there a is need for constitution of a planning group, as detailed below.
PLANNING GROUP

Structure of Automated Library

Planning Chart

The planning group has to be constituted by the university to undertake the following responsibilities

i) To make a detailed study of the existing circulation system of Gujarat state university library using the concept of systems approach;

ii) To interact with the management, staff and users so as to seek their suggestions and opinions;

iii) To visit the libraries where automation is in vogue to gain acquaintance regarding the advantages, experiences, problems and constraints encountered by them;
iv) To study the existing and relevant technology along with their benefits and constraints;

v) To prepare the project report, wherein the changes, modifications that are to be incorporated in the automated system are to be identified;

vi) To identify means of implementing the project; and

vii) To implement the project.

The group should consist of representative of the university administration and library committee; head of the library; staff representative(s); systems analyst; computer professional(s); and library/computer professionals experienced in library automation projects.

This planning group or committee should have a chairman, and the head of the library as the convener. It should meet regularly and chalk out the programme. An executive group has to be nominated to look after the implementation of the decisions and to apprise the planning group of the progress. This group should also communicate the developments to the staff from time to time.

The planning group has to take up the planning process and make a detailed study of different stages of planning.

Prior to the study it may be useful to look into the flow chart designed by Rowley (1986:17).
FLOW CHART
6.4  DEFINITION OF OBJECTIVES

Statement of objectives is the first step for any procedure or activity. The stated objectives guide the process and provide direction for future activity. Automation brings major the changes in all the library activities or routines.

The objectives of the library must have already been stated, but in view of changed circumstances i.e. in the context of automation, it is obligatory to mention the objectives for introduction of automation, such as how automation helps in the successful achievement of library objectives and how the services can be improved. In this context Rowley (1986:10) states that the objectives of computerization project must be clearly defined in the wider context of overall objectives of the library system.

The objectives can also elucidate how the automation can help to remove constraints, areas / functions that get affected, and possible changes in the library working. It may be essential not to over commit for a course of function and it is better to define the general objectives or general terms of the project.

The objectives can be categorized into two types, namely primary objectives and specific objectives

6.4.1 Primary Objectives

These objectives indicate what a circulation function will be doing. It should be stated clearly to enable to define the specific objectives of the system. These objectives should be in conformity with the library's objectives.
The primary objective of the circulation system is to ensure loan of materials to its borrowers and their timely return. This objective is the basis for any circulation System, be it manual or automated. To achieve this objective to a larger extent, the function needs to be automated.

6.4.2 Specific objectives

Manual methods are being used to achieve the primary objective(s) of circulation function. To overcome the limitations in the manual methods, the function is automated. Therefore the specific objectives are to be laid out for the automated circulation system, taking into consideration, the primary objectives and shortcomings of the manual methods. The specific objectives of the proposed automated circulation system are as follows.

i) Quick and accurate issue (charging), return (discharging) and renewal of documents;

ii) Quick and smooth reservation process;

iii) Preparation of overdue notices as and when required;

iv) Preparation of effective mechanism to manage overdue charges;

v) Efficient control over documents;

vi) Effective management of circulation statistics; and

Vii Provision of necessary information regarding the Circulation function.

The automated circulation system (ACS) has to be designed to achieve these specific objectives. The routines, operations and activities should also be planned accordingly. Once these objectives are accepted by the planning group, necessary
steps have to be worked out to prepare the detailed analysis of each objective to ensure its achievement.

On the basis of the objectives the tasks of the ACS can be identified. Corbin (1988:40) has identified the typical tasks of ACS as follows.

5: TYPICAL TASKS OF AN AUTOMATED CIRCULATION FUNCTION

As a first step in a planning process, it is desirable to formulate a model for computerization listing all itemized and prioritized information systems being maintained on a manual basis by the library. For this exercise it is necessary to break down these procedures into their constituent parts. When further subdividing these activities, each item is to be considered of its functional elements. The systems and subsystems listed below are only indicative and may vary with differing library system environments.

**These are:**

**Acquisitions**

- Selection
- Ordering
- Claiming/cancellation
- Receiving/invoice processing
- Extended procurements
- Gift tracking
- Fund Control
- Maintains information about all library related funds
- Ability to group funds (nesting)
- Track fund allocations and adjustments
- Fund encumbrance
- Fund expenditure
- Cash Balance
- Free Balance
- Automatic updating of fiscal information through recording of specific transactions
- Track year-to-date expenditures
- Create Purchase Orders

**Technical Services**
- Books
- Serials
- Special Collections

**Cataloguing**
- Books
- Serials
- Special Collections

**Circulation**
- Charge/Renewal
- Discharge
- Loan Periods
- Processing schedules
- Holds
- Messages
- Blocks
- Notices
- Transaction Recording Devices for off-line processing
- Member control
- Inventory Control

**Serials Control**
- Receipt (check-in)
- Claiming
- Bindery control
- Replacements
- Monographic serials
- Invoice processing

**Reference Services**

- Desk services
- User tools
- Bibliographic utilization
- Reprography
- Inter-library communications
- General Administration
- Grants Administration
- Library Publications
- Bindery
- Periodical Citation Searching
- OPAC
- Bibliographic Database
6.5 FEASIBILITY STUDY

A feasibility study is the study to determine the feasibility and possible ways of accomplishing the proposed system based on stated objectives, immaterial of whether it is a new system or modification of the existing system. The study should include personnel involvement, limitations such as time-lag, finances, staff and also political Considerations should be identified.

The feasibility study should be concerned with accomplishment of the project objectives in the light of costs and benefits of each approach. Further, the purpose of the study is to gather, analyse and document the data necessary to make an informed and intelligent decision regarding systems practicability. Hence, the feasibility study has to include Analysis and documentation of information required for accomplishment of project; Identification of limitations; and Study of the cost and benefit of each approach and a report on the preferred approach, which should be efficient and economical. The feasibility study can be divided into three parts. They are

i) Preliminary study
ii) Investigative study and
iii) Final report

The preliminary study determines whether the benefits to be gained from the new system will be greater than the costs involved in implementing it. If the answer is negative, the study is concluded. If the answer is positive, the analysis enters the investigative stage, where the problem is carefully defined and all details in the solution are specified.

The last phase of the feasibility study is the final report. This documents fully the work done during the first two phases. All expected costs, benefits and consequences are shown and it tells how and when the new system should be implemented.
If this approach is chosen, probably no library may be able to opt for automation. It may be difficult for any service institution to show real benefits in terms of cost and benefit rather than insisting on efficiency and effectiveness i.e. intangible benefits. Automated libraries have proved that their services have improved, the use of their resources has greatly increased and their managements have become more effective than before. On the basis of this presumption computers are used and feasibility study needs to be made.

Another important decision to be taken is, who has to make the study. The study could either be made by a single person or by a team of professionals. The outcome of team work will be a more effective study. If it has been agreed that team work is beneficial, the next decision would be whether to appoint a consultant or to nominate a committee. It may be advantageous to appoint a committee rather than a consultant. The members of the committee should be well acquainted with the library procedures and they should be Available in the library.

The committee should consist of members from the library, computer division, and management the complexity of the committee depends on the work to be undertaken or the systems to be investigated. If the investigation is larger in nature, it can be divided into independent tasks and each may be assigned to a different group. The results may be Evaluated and incorporated in the study. The study may be coordinated by a Secretary or Chairman.

The feasibility study for ACS in Gujarat state libraries has to be undertaken by the planning group as suggested in section 6.3. This group has been suggested in conformity with the above discussion. Further this committee need not make any preliminary study as the benefits of automation have been an accepted norm and the cost benefit analysis does not play a key role in a non-profit service institution like a university. Hence the group should directly make the investigative study and prepare a final report.
6.5.1 What to Investigate?

A detailed study of existing system has to be made as a part of feasibility study. The study should include the procedures adopted; time consumed for each operation, amount of work output, staff time involved and cost etc. The work and operations should be studied in relation to the stated objectives i.e. how the existing procedures are contributing to the achievement of the objectives.

A detailed study of existing circulation system in Gujarat state university libraries has been made (Chapter 5), wherein the procedures have been examined and the limitations have been identified. Due to lack of necessary data with the library, the cost and time studies could not be made in detail.

The university and other libraries in developed countries have automated their circulation systems. On the basis of their experiences they have further developed software to provide many provisions that were not possible earlier. Further, the software is under continuous development and the resultant features are being offered continuously to the libraries. The experiences and available provisions in the ACS have been published in several books and journals. With the available literature, it will be easy to identify and formulate the goals of the proposed ACS for Gujarat state University libraries. The checklist functions of ACS listed by Levees (1989:207-9) are enclosed in the Appendix A. While pointing out the loopholes in the existing circulation system of Gujarat state university libraries an attempt was made to specify the possible features and benefits of ACS.

The third step is to make a detailed study of the new or proposed system and prepare a report, which should include the main characteristics of the new system, an analysis of proposed system, cost estimation and preliminary planning. There is also a need to identify constraints such as time, finances and political needs.

After the analysis and study of the proposed system, it is necessary to correlate and determine the interrelationship between the existing and proposed systems.
The records and forms used in manual methods have to be changed to facilitate the use of computerized systems. The changes have to be incorporated and new record structure should be designed. It is possible to get such information from system suppliers.

The team and the library staff may be asked to see the demonstrations of the computerized systems. Observation by the team and staff who are actually involved in the system operations may provide an opportunity to assess, evaluate and suggest modifications of the system.

Gujarat state University’s has a computer department and a computer centre. The services of this department and the centre have to be utilized in preparation of the feasibility study.

The feasibility report submitted by the Inter Agency Working Group, UGC (1988) to UGC on INFLIBNET should also be consulted. This report has given several technical details as well as proposed programmers for automation and networking of university libraries in India. This voluminous report may even provide an idea and guidelines for preparation of the feasibility report. This may be used as one of the resource documents for the study.

After preparation, the report has to be submitted to the university or library committee for evaluation and release of necessary finances.

Some feasibility reports may even define the data sheets and record structures, whereas some may keep such analysis and definition within the library to be taken up as a next step in the process of automation.
6.6 DEFINITION AND DESIGN

After the feasibility study, there is a need for further defining and designing of the system’s functions and procedures. The objectives of the new system has already been stated but at definition stage, further an in depth study is made on the basis of feasibility report. The outcome of this study supports implementation of the results in the subsequent design phase. This stage involves analysis of the system that was examined in the feasibility stage. This phase can also be termed as analysis stage.

At this stage re-evaluation and re-assessment of the objectives of the current system is made and their achievement is reviewed. The system needs a step by step examination and objectives have to be defined for each step. These objectives help to assess the system requirements. It may be difficult to define the functions and procedures of circulation system in Gujarat state university library’s as at present; its emphasis is only on issue and return of the books. However, the definition could be made on the theoretical basis and experience gained by other libraries. In the design phase, the programmers and procedures to be adopted are stated in detail. Standards and experiences have to be taken into consideration at the time of designing the system. It may be relevant to state that the bar code technology will be more appropriate for use in ACS as it is found successful in other automated libraries. The tasks involved in the design phase are

i) Description of physical and administrative organization of the library with the aid of Charts, manuals and descriptions,

ii) Detailed examination of work flow using flow charts and decision tables.

iii) Finalization of processing, output requirements and data relationships, and their Interpretation in terms of specific equipment, operating environments And response times.

iv) Collection of information such as file sizes, processing times and costs and Designing the Formats of all files and forms.

v) Specification of the logical manipulations and transformations of the library function that are to be performed by the computer.
vi) Development of requirements of machine-stored data, and establish control procedures.

vii) Preparation of specifications for programmers and manual procedures. The tasks explain that planning is totally dependent on the design phase and it is necessary to study different aspects of designing a system.

BLCMP (1991) states that there is a need for study of the following while planning a computer system

1) Software;
2) Hardware;
3) Telecommunications;
4) Environment;
5) Consumables and
6) Implementation.

6.6.1 Software

Software selection is one of the major tasks of automation. The primary considerations for choosing the software are

Which functions / areas are to be automated? or

What do you want to do?

Which Software to select?

If the library wants to automate a single function, naturally it will be simple, less expensive and will not include complexity. On the other hand, if all the functions are to be automated, then the system will be complex, a greater number of elements are found, and the costs will be more and also needs to integrate all the functions. Selection of Software is a complicated issue and partly depends on the number of functions to be automated. Software availability can be classified into three categories In-house; commercially available; and Cooperative.

Many libraries in India designed their library software with the help of their staff from library and computer centers. This is made on the basis of the existing operations in that particular library and is exclusively used by them. This software is described as 'in-house' and much such software are available in several organizations in the country.
Due to the demand for library software, several Commercial organizations have developed library software for commercial purposes. Some of the important commercial software in India is WILYSIS, LIBSYS, and TULIP. Recently the DRDO has developed a library software namely MAITREYI on the basis of CDS-ISIS. It will be commercially available soon.

There is no cooperative effort by the organizations to develop co-operative software on the lines of BLCMP (UK). Generally the commercial software offers several facilities in comparison with the in-house software. Even the commercial software are subject to continuous development to withstand competition in the market.

In the light of implementation of INFLIBNET project, UGC should plan for developing library software and the same must be provided to the universities at a nominal price or free of cost. UGC can also take the help of IITs, DST and Computer Maintenance Corporation (CMC) in developing the software. If the library intends to purchase commercial software, it is necessary for the selection team to visit automated libraries, to examine the facilities available and problems encountered by the library staff.

The librarian can ask for quotations from software companies and arrange for demonstration, which can help to examine the facilities of each system. Observation and discussion provides enough background and helps the team in selecting the software. It is also the experience of the libraries that software houses insist on the appointment of a library systems manager. In the UK, such positions exist in almost all the university libraries. University libraries in India in general and OUL in particular can create such positions.

Herring and Mackenzie (1986) suggest the investigation of different systems in terms of Cost; Ability to cope with present and future systems; Familiarity of the system (Familiarity creates less problems); Proximity of maintenance engineering facility.
Bob Clinging, Systems Manager, University of Sheffield Library (UK), suggests looking into the following factors (addition to abo Maintenance and back-up facility; History of supplier; Training facilities; To what extent the library specifications are accepted by the system; and Experiences of the users of the system.ve) while selecting the system

**General**

a) Is the software used by information units, and if experiences?
b) How much does the software cost?
c) Who wrote the software?
d) Who supplies the software?
e) Can the software carry out the required application in a reasonable time?

**Technical**

a) Language. Is the software available in a language, or dialect of a language, that is available on the computer system to be used?

b) Operating system. Is the operating system required by the software available on The computer system to be used?

c) Hardware configuration. Does the software require minimum hardware configuration?

d) Other software. Are other programmers, such as sort programs, edit programs, or Word processing programs, required before the software can be used?

e) Data limits. What are the limits on the number of records, size of file, number of fields? Size etc?.Are fixed and variable fields allowed?
f) Easy to use?

g) Format in which the package is supplied, whether compatible to the system or not.

**Support**

a) What documentation is available?

b) Is there any support provided, by the supplier or the producer, in setting up?  
The software?

c) Is there any training provided in the use of the software?

d) How are modifications to existing software to be obtained?

e) How are future versions of the software to be obtained?

f) Is there a club of existing users? There are several examples of users of applications packages which have formed clubs or user groups which usually produce newsletters, organize conferences and course, keep details of users of the package and act as a pressure group.

**Legal factors**

a) Is there a warranty?

b) Does the legal department of your organization approve of the contract?

Collections in Gujarat state university libraries consist of more than one language. It is necessary to examine whether the system can accept the multi-script or not. If the system does not accept, then Major collections will be kept out of the computer system, as transliteration is a difficult job. At present several systems have been
developed where the Indian scripts are accepted. The different categories of software used by the universities and polytechnic in the UK (participating in JANET) are represented in the Pie Chart below.

Prior to the purchase of software, the library has to incorporate the following items in the deal while purchasing a software system

6.6.2 Hardware

Hardware requirements depend upon the size of the library. University libraries are generally larger in size and need either Mini or Mainframe computers for their operations. The hardware to be purchased includes

- Computer,
- Disk drives,
- Terminals,
- Light pen,
- Printers, and
- Barcode equipment.

The planning Group has to gather information regarding hardware. It could be collected from books, by visiting exhibitions, looking at product reviews, consulting trade literature, computer engineers and different agencies. The expert advice by the department of Computer Science and Computer Centre of Gujarat state university library’s could be useful. The information about hardware availability may also be procured from different manufacturers. Hardware may be selected on the basis of merit, cost, maintenance factors and provision of software. Computer experts help has to be taken in selection of hardware.

Some of the factors stated for selection of the software are also applicable to hardware. There are other factors that have to be taken into consideration. While deciding the memory size, future requirements may be taken into consideration. The experience of libraries shows that new services were introduced in view of computer
acceptability, and such introduction needs memory. Hence it had been advised to be liberal in estimating the memory size. Availability of service and maintenance facility in the local area is one of the important factors which need serious consideration. The Gujarat state university being located in a metropolitan city, the problem of service and maintenance may not pose much difficulty.

At present the libraries have an option for choosing turnkey systems. If the software and hardware are purchased separately, it may be necessary to examine the compatibility.

Gujarat state library has the computer hardware facilities at several departments apart from its computer centre. If the existing hardware is utilized for library automation, the problem of hardware selection does not arise.

**6.6.3 Telecommunications**

Data lines have to be planned for different operations. These lines have to be flexible, to allow additional connections or outlets if necessary and besides, the power and data are integrally related. So it may be necessary to run both the lines in parallel. Heathcoat and Stubley (1986) suggest installation of twin compartment trucking. It may be difficult to have such a facility in existing building, as the power lines are already fixed.

The authors also suggest use of surface-mounted busbar trucking which allows socket outlets for power and data to be positioned wherever they are required.

Bob Clinging suggests the use of a multiple cable system. Which can facilitate connecting several monitors on a pair of cables as the future requirements on the number of monitors are not known? This is especially advisable while running cable to other buildings. Precaution has to be taken on the length of data cables, as it appears that long hard wired lines may contribute to corruption of data.

**6.6.4 Environment**
Automation needs creation of ideal environment. This is necessary for improved performance and optimum utilization of the facilities. Different factors involved in environment are discussed below.

6.6.4.1 Lighting

Lighting influences proper use of documents. Lack of sufficient light strains the eyes, hence the lighting is one of the environmental factors essentially considered. The amount of light falling on the surface or object is known as illumination, which is measured in units called lux \( \text{lumen per square meter} \, \text{lm/m}^2 \). High level light can cause reflected glare and create dark shadows and marked contrasts between those surfaces which are illuminated and those which are not (Dyer and Morris, 1990).

To ensure the Existence of the right amount of illumination, general standards have been suggested. Chartered Institution of Building Services (CIBS) (UK) (1981) suggests 300-500 lux illumination for VDUs. The same is also suggested for study areas. This has been agreed by Health and Safety Executive, (UK) (1983), (as quoted by Heathcoat and Stubble, 1986). Dyer and Morris (1990) suggest consideration of several other factors such as illumination level, light sources, light color, glare and other environmental factors such, as floor, ceiling and wall. The authors have stated that VDU screen background emanates 5-15 cd/m2 luminance’s (Luminance is measured in candela/meter square).

In India there is enough natural light and the libraries have to adjust and reposition the monitors to avoid the glare on the screens. A lighting specialist should be consulted to provide pleasant and glare free lighting facility.

6.6.4.2 Noise
Noise is the sound, which is caused by fluctuation of air pressure. It is measured in decibels (dB). Noise is unwanted sound, which creates a distraction from work or interferes in concentration of individual work. It will be difficult to concentrate on work if the noise level is more than normal. Computers, printers, air-conditioners also create noise, so the libraries have to plan to avoid excess noise by using sound absorption equipment such as acoustical ceiling, acoustic tiles, acoustical partitions and carpeted floorings.

Dyer and Morris (1990) describe the effects of noise and methods to reduce its levels. The guidelines and methods have been suggested by them which may be used to reduce the noise level. They also suggested aiming the noise level of 50-55 dB in a library environment.

6.6.4.3 Heating

There are several factors that affect the library's climate. These factors have to be studied combinedly. The factors are Air temperature of 21x - 23x C, 15 cm/sec of air movement and 30%-70% of relative humidity is generally recommended for library environment Heathcoat and Stubble (1986) state that 50-100 W and 4 K.W. of heat is generated by each VDU and Mini computer respectively. Users in Indian libraries suffer due to heat and the libraries may have to plan for air conditioning. Alternative arrangements have to be made to reduce the heat level. Curtains made of cloth or straw (straw curtains are popularly known as used in summer) may be arranged. However computer suppliers insist on air-conditioning at least of the computer rooms.

6.6.4.4 Computer Room

The computer room is the place where the computer equipment is installed. It may be located away from the study areas as they emanate heat and noise. These rooms
Should be air-conditioned to control the heat. Security arrangements for computer room have to be made to protect the equipment and data. Expert advice pay be sought to decide the location of the computer room in the library.

6.6.4.5 Space Layout

Space planning and design is necessary to optimize the effectiveness and efficiency of circulation function, whereby the floor space is carefully planned. The space planning should facilitate flexibility, comfort, productivity and support to aesthetic sense.

The library counter has to be rearranged to facilitate the use of monitors. If necessary, the counter may be shifted. Ergonomics must be considered while planning the furniture and space. There may be a need for procuring new furniture for fixing the VDUs. Care and precaution must be taken to provide sufficient light, air and space while planning the space for both staff and users. Advice of consultants / architects may be sought for designing the space layout.

6.6.5 Consumables

Stationery, tapes, disks, and self adhesive labels are continuously required. Specification may be prepared for various items on the basis of requirements. Quality and availability of consumables have to be ensured.

Records and forms are also consumables. These are used by libraries for different manual operations. Some of the records and forms may become obsolete in the context of automation and the remaining may need modification to use with the computers. The changes/modifications depend upon the information to be included in each record or form. They need to be carefully designed.

Record structure has to be defined for the computer system, wherein categories of data have to be specified. It is essential to quantify the possible data in each category. The specifications for records and forms have to be prepared on the basis of
requirements. Visits to other libraries may provide a better idea in creation of new record structures and forms.

In addition to the above factors, there is a need to examine other factors such as operations, time planning and bar code, as discussed below.

6.7 OPERATIONS

In the process of automation several operations in the existing circulation system becomes obsolete. These include taking the borrower card, stamping on the book card, slipping book card into borrower's ticket and date-wise arrangement of these cards. Some of the operations may need to be modified and new operations have to be planned to suit the needs of computer environment. It is necessary to examine, analyze, evaluate and re-design the operations, which should support the objectives of ACS.

6.8 TIME PLANNING

Time is an important factor in planning and implementation of any project. It is necessary to plan and programme the automation according to a specified time schedule. To make the time planning, necessary techniques such as Gantt chart, PERT and CPM may be used. However it is essential to stick on to the schedule and complete the automation project within the stipulated period.

6.9 BARCODE

Barcode is a set of vertical lines or bars Of varying size drawn representing usually numbers, which are drawn as well as read with the computers. Bar code technology is most appropriate and useful for circulation system. The assigned numbers are printed in specified bars. The bar code software is available in the market. This software may
be used to prepare bar codes for books and borrowers' tickets. It is also to be noted that the bar code is difficult to understand without the necessary aid.

The light pens are used to read the bar code from the books and borrowers' tickets. The light-pen and the bar code together are used for issue and return of the books. This technology supports fast and accurate issue and return of books by a single person.

The barcode has to be designed by the library. Experiences of other libraries can be taken into account in this regard. There is a need to decide the number of digits to be assigned in bar code. The number of digits depends upon the information to be included in it. It may range between 8 to 14. For a book the barcode may consist only accession number, in such cases 6 to 7 digits may be sufficient.

If the library intends to include form, type and year of the document in addition to accession number, the number of digits will increase. The option is totally left to the Library but the design must be made much in advance before implementation. The same is applicable to design barcode for borrower's tickets.

It may be necessary to note that using the barcode and light pen technology may create few problems in Indian context. The borrower may deny stating that the book has not been borrowed by him. Further, he may insist for proof of issue of the book to him. Further, he may state that it is the mistake of the computer. To avoid complications Initially Indian libraries may have to retain book card and obtain the signature of the borrower as and when the book is issued. It may look a cumbersome work but not true in Practice.

Planning needs study, consultation, observation and concentration. The library should not hesitate to consult professionals from different fields while planning for automation. Salmon (1975) states that poor planning, poor design, and poor implementation are the evils responsible for troubles and problems. The author states that lack of sufficient analysis, goals, objectives and market research may be responsible for inordinate costs.
Even unrealistic assumptions, wishful thinking, lack of homework, lack of accommodating local considerations and lack of sufficient finances are some more factors that are responsible for poor planning and poor design, which will be a major factor for the failure of the project. A good design should be based on analysis of the problem, identification of alternative solutions, determination of advantages and disadvantages of each alternative approach.

The design is based on practical experience and standards. Even good choice of hardware and software, realistic assumptions and equal weightage for all the operations and activities contribute for good design. Planning is the main component on which implementation and success of the system depends. Several books are available on automation, and may be consulted at the time of planning. Once the planning is completed, and the library has funds, it should go ahead with the implementation of the project.
6.10 RETROSPECTIVE CONVERSION

The data and records prepared during manual methods need to be converted into machine readable data. This is a complicated task and involves heavy expenditure, time and human resources. Especially the problem is more in large university libraries as large quantity of data needs to be converted. Records such as catalogue and circulation.

Records need to be converted. To convert the catalogue, the data sheets have to be filled by physical examination of the books. This data has to be put into the computer and the records needs to be created.

Retrospective conversion is a major work if all the functions are automated. The library needs careful planning for such conversion. But when only one function, i.e., circulation is automated Retrospective conversion will be very easy and useful.
6.11 SUMMING UP

Automation procedure can be divided into planning and implementation. Planning is essential to have effectiveness and economy. It involves several steps. Preparation is the First step of planning, wherein acceptance of management, staff and users has to be taken. Sanction of necessary finances is an important factor.

A planning group has to be constituted with library professionals, computer professionals, systems analyst, management and staff representatives. This group has to Oversee both planning and implementation.

The objectives of the project have to be spelt, and they are to be categorized into primary and specific objectives. These objectives provide guidance in preparation of plans, identification and design of equipment, software, files and environment.

Feasibility study has to be made on the basis of the stated objectives. This study has to make at three levels, namely, preliminary study; investigative study and preparation of final report. Several aspects of automation are discussed at the investigative study level and they include the existing system, proposed system, observation of automated libraries, discussions with professionals involved in automation.

After completion of the final report, the objectives have to be re-assessed and defined on the basis of the report. In the design phase, several aspects such as software, hardware, telecommunication, environment, consumable and implementation are to be discussed in detail. Operations and time planning should also be designed in the context of the newly proposed environment.
6.12 Packages Available for Automation Commercial Open

Commercial:-

- Autolib
- Easylibsoft
- E-Granthalaya
- Gyanodaya
- Libra2000
- Librarian
- Library Manage
- Libsuite
- Libsys
- Nalanda
- NewGenLib
- NexLib
- Rovan LMS
- SLIM
- SOULand manymore!!!!!
Open Source:-
- Emilda
- Glibms
- Java Book Cataloging
- System
- Koha
- My librarian(For Schools)
- OpenBiblioOpen-ILS
- PhpMyLibrary

Freeware:-
- WebLis
- FireFly