# LISPA (Library and Information Center Staff Planning Advisor): A Microcomputer-Based System

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*Staffing required for a library depends upon various factors such as number of working days in a year, hours the library is open, leave allowed per year, total stock, number of documents added per year, number of documents circulated per day, number of ready reference queries handled per day, types and quantum of services offered, and number of readers requiring guidance per day. LISPA is a set of programs developed to run on IBM PC/AT computers and compatibles to assist planning for library staff requirements, taking into consideration the above factors and more. Though it is not an expert system, it encapsulates the expert knowledge of a library staff planner. Although LISPA has built-in default values and ratios for computing the staffing required for a library, users can alter these values and standards and compute staffing requirements based on their library's needs. That is, LISPA allows the planner to choose the kinds of services required and the operational environment of the library and control the computation process according to these requirements. This facility makes LISPA useful for planning staffing needs for libraries in different socioeconomic and technological environments. The system can be used to check the present staffing needs of a library, to estimate its future requirements, and to plan staffing needs for a new library. The staffing requirements are computed and presented in the following categories: senior professionals, professionals, paraprofessionals, and skilled and unskilled staff. LISPA can be used both to plan and to teach how to manage staffing needs in a library, since it displays the steps involved in the computation and also the functions of the different sections in the library, including the various kinds of services a library can offer. The system is written in CBASIC and is easy to use, as it prompts the user throughout its execution.*

Several standards for staff planning for college, university, special, research, and public libraries have been established.[1-13] But standards for planning staffing needs in libraries based on job analysis and workload were perhaps first established by Ranganathan.[14,15] His staff plan model[6,16] has been used as the basic model for the development of draft plans for several libraries and information centers in India[17-20] and has been found useful in providing basic guidelines. Libraries have different working hours, working conditions, rules and regulations, sizes, equipment and facilities, and services offered, depending on the kind of organization they serve, e.g., college, university, research institution, business, industry, municipal body. LISPA was developed on the basis of work-performance data from a large academic library in India, and the system defaults will need modification in order to make the system applicable to libraries in different environments. LISPA is flexible enough to accept data regarding workload and other parameters regarding a particular library for which staffing needs are being planned, and also to allow the system's default values to be modified according to the socioeconomic and technological environment concerned. That is, LISPA encapsulates the expert knowledge of a library staff planner, which can be temporarily modified to suit to the requirements of a particular situation. But the knowledge base reverts to its original state once the program is executed. This is because both the knowledge and the rules are embedded in the programs, unlike with other systems.[21]

LISPA is derived from Ranganathan's model[6,14-16] with several modifications. The system is self-documenting and runs on its own once the command LIPLAN or LISPA is entered. It is interactive; all data to be input and most of the parameters required are prompted. The functions and services required for a particular library can be selected and the staff planned accordingly. It runs on an IBM PC/AT computer or compatible running under MS-DOS 3.1 and higher.

The system is best suited to developing countries where automated systems for acquisition, cataloging, circulation, etc., are not yet commonly available. However, because the system displays and allows the standard default values to be changed, it might be possible to use it for planning of staffing needs for libraries in other socioeconomic and technological environments. LISPA can also be used as a teaching aid, since it displays brief descriptions of the functions of the different sections of the library, the various documentation and information services that can be offered, and the steps involved in computing staffing needs.

The system plans staffing for the following sections of a library: acquisitions, serials and periodicals, technical processing, maintenance, circulation, reference, documentation and information services, and

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administration. The system does not cover binding; printing and publication; training or retraining of staff, readers, and users; or maintenance of buildings, computers, networks, AV and reprographic equipment, etc. It should be noted that the functions and services of the planner's library might be grouped into sections other than the above. The staffing needs computed will then have to be noted separately and combined according to the organization of that library.

## System Overview

As per Ranganathan's model,[14,15] a library is like a hospital. In a hospital there are medical superintendents, surgeons, anesthetists, general practitioners, specialists, nurses, pharmacists, skilled technicians, clerical staff, and unskilled cleaners, etc. Except for skilled technicians and clerical and unskilled staff, all hospital employees are, more or less, professionals. Even some skilled technicians, such as those who operate X-ray, EKG, and EEG equipment, are attuned to the dedicated medical profession.

Whereas a hospital staff attends to physical and physiological weakness, a library staff attends to intellectual weakness. Hence in a library, too, all employees, except for skilled and unskilled staff, must be professionals in one sense or the other, though they possess different levels of professional expertise. LISPA is built on this philosophy. It delineates the following categories of staff for a library:

1. senior professional (M.A./M.S. plus M.L.I.S. plus about six years of library experience)
2. professional (M.A./M.S. plus M.L.I.S. plus about two years' library experience or B.A./B.S. plus M.L.I.S. plus about three years' library experience or M.A./M.S. plus B.L.I.S./Dip.L.I.S. plus about four years library experience or B.A./B.S. plus B.L.I.S./Dip.L.I.S. plus about five years' library experience)
3. paraprofessional[22] (grade 10/12 plus certificate in library science or one year of library experience)
4. skilled staff (grade 10/12 plus typing, keyboarding, accounts, and stenography skills)
5. unskilled staff (literate)

In some situations the first three categories above are classified as professionals by LISPA for computational purposes and then assigned to the different levels. LISPA allows the planner to reallocate the staffing levels if the program's categorization is not acceptable.

LISPA consists of ten major modules. The first module, ASSIST, briefly describes the system. The second module, WORKIN, deals with opening hours of the library, duty hours, leave permitted for workers, etc. The third module, CIRCUL, deals with the circulation section. ACQUIS, the fourth module, deals with the acquisition section. The fifth module, SERIAL, deals with the serials and periodicals section. The sixth module, TECHNI, deals with the technical processing (classification and cataloging) section. The seventh module, MAINTE, deals with the stack maintenance section. REFERE, the eighth module, deals with the reference section and service. The ninth module, DAIS, deals with the documentation and information services. The tenth module, SUPERV, deals with the supervision and management section and presents the consolidated staffing plan.

## ASSIST Module

ASSIST is invoked by the command LIPLAN; it asks for the name of the planner and uses that name to identify the computed values to be stored in a file named COMVAL.DAT. It requests a password and then displays a description of the system along with the listing of the input data required and the default values set in the system. Input data required include those listed in table 1.

This module also gives hints on how to run LISPA and how to resume after quitting at the end of any module. At the completion of a module, there is provision for selecting another module to be run. However, it is better to run the modules in the sequence indicated by LISPA, because the values computed in one module may be needed in another. To familiarize themselves with LISPA, users may wish to run the system using the default values and hypothetical values for input data. The major modules in the system, together with their functions, are displayed in the ASSIST module, allowing users to select the module they intend to run or to quit the program.

**Table 1**
Input Data

| Input | Default Value |
|---|---|
| No. of days library is open in a year | 365 |
| No. of days a worker is given leave in a year | 162 |
| Ave. no. of hours library is kept open in a day | 12 |
| No. of hours of duty for a worker in a day | 8 |
| No. of hours circulation counter is open in a day | 12 |


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## WORKIN Module

The second module, WORKIN, prompts the planner to key in the average number of days per year the library is open, number of days per year a worker is allowed leave, number of hours per day the library is open, and number of duty hours for a worker. The default values for the above can be changed by the planner. Using these values, the shifts required per day and the "batches" required for the staff to be available throughout the library's hours of operation are computed. This value of batches is used to multiply the value of staff for vigilance at the entrance gate, and for reference and supervision computed on the basis of workload, to make them available throughout the hours the library is open if the planner so desires.

## CIRCUL Module

This module identifies some of the functions of the circulation section as lending and noting return of documents, updating membership files, issuing borrowers' identification, requesting return of overdue materials, renewing loans and reserving documents, handling of documents reported lost, processing interlibrary loans, and recording circulation statistics. The planner is prompted to key in the average number of hours the circulation desk is open per day (which may be less than the number of hours the library is open).

The number of staff (excluding unskilled staff) required is computed, based on the hours the circulation desk is open. Then, based on the average number of transactions that can be handled by a staff member at the circulation counter (the default of two hundred transactions per day per staff member can be changed depending on whether the circulation function is automated) and the average number of transactions per day, the staffing needs computed on the basis of hours the desk is open are checked for adequacy for handling the total number of transactions in a year. If the figures are inadequate, then the staff for the excess transactions (over and above those that can be handled by the staff computed on the basis of hours the circulation counter is open) is computed and added.

A member of the computed staff can be designated by the planner to be the head of the circulation section. If not, one is assigned to the paraprofessional category. The rest of the staff can be assigned to the same paraprofessional category or to the unskilled staff category by the planner. The number of unskilled staff required for assistance is computed as one for every two other circulation staff. This default can be changed by the planner, or the unskilled staff value can be nullified. Another unskilled staffmember to monitor the entrance gate (gate register, articles left by readers, etc.) can be added if the planner desires. The computed staffing needs are displayed according to the categories (a) professional, (b) paraprofessional, and (c) unskilled staff.

## ACQUIS Module

The fourth module identifies some of the functions of the acquisition section as selection of documents, ordering, arranging for payment of invoices, and accessioning of all documents, including bound volumes of periodicals and serials (excluding current serials). It prompts the planner to key in the number of serials and periodicals currently received, the number that are bound and added to the collection, and the average number of other documents added annually. Then it computes professional staff (including paraprofessionals) as one person for every six thousand documents added annually. The skilled staff required (for typing and keying in orders, checking invoices, accessioning, etc.,) is computed as one person for every two professionals or paraprofessionals. These defaults can be changed by the planner depending on whether automated facilities are available or planned for the library. The unskilled staff required (for checking pages, stamping the library's emblem/seal, etc.) is computed as one for every two professionals or paraprofessionals. This default value for the computation of unskilled staff can be increased or decreased or nullified by the planner.

Among the professional staff (which also includes paraprofessionals), one person is assigned to the professional category after confirmation by the planner, and the rest are assigned to the paraprofessional category by this module. The computed staffing need is displayed according to the following categories: (a) professional; (b) paraprofessional; (c) skilled staff; and (d) unskilled staff.

## SERIAL Module

This module identifies the functions of the serials and periodicals section as selecting, ordering, renewing, canceling, arranging for binding of completed volumes, claiming missing issues at the appropriate time, and arranging for the display of the current issues on display racks. The planner is prompted with the number of serials and periodicals currently received (data keyed in while running the ACQUIS module). The professional

staff (including paraprofessionals) is computed as one person for every five hundred current serials or periodicals. This default value can be changed by the planner. The skilled staff (typists, keyboard operators, clerks) and unskilled staff required for assistance are computed separately as one person for every two professionals. These default values can be adjusted or nullified for each category of staff as needed by the planner.

Among the computed professional staff, 50 percent are assigned to the professional category; the rest to the paraprofessional category. The staffing values are then displayed according to the category of staff.

## TECHNI Module

Some of the functions of the technical processing section are identified by this module as classification, cataloging, updating the catalog, shelflist preparation, and releasing recent additions list. The professional staff (including paraprofessionals) required for the technical section is computed as one person for every three thousand documents added in a year. It is assumed that original cataloging is required and that documents are classified using a faceted classification scheme such as Universal Decimal Classification (UDC). This default value can be adjusted by the planner to suit the kind of technical processing work of the particular library (such as those where data are downloaded from OCLC, MARC, etc.). The skilled staff (for typing cards, entering records, etc.) required is computed as one person for every two professionals, including paraprofessionals. The unskilled staff required for the technical section (for pasting labels and preparing the volumes) is computed as one person for every three professionals. These default values can be adjusted by the planner. The skilled and unskilled staff value can be nullified also if needed.

Of the computed professional staff, 60 percent are assigned to the professional category; the rest to the paraprofessional category. The module displays the staffing needs according to the staff category.

## MAINTE Module

This module identifies some of the functions of the maintenance section as shelving of newly added, returned, and consulted volumes; maintaining shelf arrangement in the stacks, i.e., shelf rectification and easing, moving volumes as necessary; maintaining gangway, bay, shelf, tier, and plank guides, boards, and labels; renewing old book tags; identifying and sending volumes for binding or rebinding and repair; verifying continuous stock; and maintaining the interior of the library, including seating arrangements in the reading room and other furniture. The planner is prompted to enter data such as the total number of volumes in stock, the average number of volumes to be replaced on the shelves in a day, and the average number of volumes added in a year, including completed volumes of serials and periodicals. The staff (mainly paraprofessionals) required is computed as one person for every 100,000 volumes in stock; one person for every 200 volumes to be replaced in a day; and one person for every 6,000 volumes newly added in a year. These default values can be changed and if necessary particular computations can be nullified by the planner.

Of the professional staffing needs computed for the stack maintenance section, one person is assigned to the paraprofessional category; the rest, to the paraprofessional or unskilled category as desired by the planner.

This module further prompts the planner to key in the number of seats (20 percent of potential readers) and research cubicles (20 percent of research scholars, R&D staff, and teachers) and computes the unskilled staff as one person for every 1,000 seats (including research cubicles). These default values can be adjusted by the planner. The computed staffing for the maintenance section is then displayed according to the category of staff.

## REFERE Module

This module identifies some of the functions of the reference section as initiating newcomers and introducing them to services and resources (library tour); answering ready reference queries; arranging in the "replacement shelf or cart" the returned volumes; helping readers to locate documents and to use other services in the library (reader guidance); maintaining vigilance; and studying shelf, catalog, and reference tools to become familiar with the resources of the library.

The module points out that services other than ready reference service (questions to which answers cannot be found out readily from sources such as dictionaries, encyclopedias, directories, compilations of bibliographies, online/CD-ROM search, SDI, etc.) are not included in the reference module but are included for convenience in the documentation and information services (DAIS) module. Most libraries do not have a separate section for documentation and information services but include these services under the reference section. For such libraries the staffing need computed for the DAIS section must be added to that for the reference section.

The planner is prompted to key in the average number of readers requiring assistance or guidance per day (if he or she desires to include readers' guidance service), the average number of ready reference queries to be handled per day, and the average number of returned volumes to be arranged on the replacement shelf or cart, if this is to be done by the reference staff. The professional staffing is computed as one person for every fifty readers requiring guidance in a day; one person for answering every fifty ready reference queries in a day; and one person for arranging 250 volumes on the replacement shelf. The planner can change the above default values. It is also possible to nullify the functions not needed.

This module then multiplies the computed professional staffing needs by the value of batches to arrive at reference staff needed to work through the open hours of the library, if the planner allows it. The unskilled staff required for the reference section is computed as one person for every four professionals in the reference section. This default value can be adjusted or nullified by the planner. The computed professional staffing need is as such assigned to the professional category and is not subdivided into the paraprofessional category.

The staffing for the reference section is displayed by this module as belonging to the categories (a) professional and (b) unskilled staff.

## DAIS Module

This is the largest module in LISPA. It identifies some of the functions of the documentation and information services section as identifying the information needs of each reader and category of readers; developing and updating subject-interest profiles of selected individuals and groups working on projects; developing and maintaining directories of products, processes, experts and specialists, institutions, industries, and other organizations of interest to readers; producing and distributing various information products and publications to meet the readers' needs on demand and in anticipation; and arranging for translations. A list of documentation and information services is then displayed as follows:

- Current-awareness bulletin
- Selective dissemination of information
- Patent-awareness bulletin
- Retrospective bibliography service
- Database, CD-ROM, and online search service
- Notification of new and ongoing research projects, forthcoming conferences, seminars, trade fairs, exhibitions, etc.
- State of the art and trend report service
- Translations service
- New products, processes, and techniques announcement service
- Comparative product and process profile service
- News briefs, clippings, management and digest service
- Environmental scanning service
- In-house database service
- Technical enquiry service
- Referral service

For each of the above, an indication of target audience; size and makeup of text of any publication; periodicity (frequency of publication); and minimum professional staff required for the indicated quantum of work are given. Some of the documentation and information services that are closely related are also mentioned, so that overlapping and irrelevant services can be excluded in selecting the ones required. An example is given below:

### Patent Awareness Bulletin Service

*Purpose:* To disseminate information about relevant new patents and utility models
*Audience:* Research scientists, R&D staff, design group, diversification manager, and research scholars
*Makeup of text:* Entries with informative abstracts arranged under suitable subject headings with appropriate indexes, if necessary.
*Size:* About 100 entries
*Periodicity:* Bimonthly
*Staff Strength:* 0.5 professional work-year
*Remarks:* This service is required if the parent organization of the library is an R&D laboratory, an industry, or a research institution. If current-awareness bulletin or any other regular service covers all the relevant patents, then this service may not be required.

The names of each of the documentation and information services are again displayed so that the planner can select the appropriate ones for the library. For each of the services selected, the professional work-years required, based on a standard quantum of work for the concerned service, is displayed. Manipulation of the computation of the staffing based on change in one or the other parameters affecting the quantum of work has not yet been incorporated in LISPA. However, the default value of professional staffing need for individual services can be adjusted by the planner. The module then displays each of the selected services and the professional staffing required for each. The skilled staff required to assist the professional staff is computed as one person for every two professionals in the DAIS section

to cater to the need for typing and other clerical work involved in the production of information service products. This default value for skilled staff can be adjusted by the planner. The staffing required for the DAIS Section is displayed under the following categories: (a) professional staff; and (b) skilled staff.

## SUPERV Module

Some of the functions of the supervision and management section displayed are planning; coordination (between the library and the parent organization, if any); budgeting, finance and accounts; supervision, control, conflict resolution, and personnel management; correspondence; annual report coordination and preparation; stores; and liaison with outside organizations.

The professional staff required for this section is computed as follows:

- Head of library: one professional. If needed, one additional professional for supervising every fifteen other professionals in the library.
- For finance and accounts, correspondence and stores: minimum one skilled staff. If needed, one additional skilled staffmember can be added for each professional in the supervision section.
- Unskilled staff for assistance: Minimum one person, and if needed one additional for every five professionals in the supervision section.

The default values for the above computation of staffing can be adjusted by the planner as needed. The staffing needs required for the supervision section are then displayed under the following categories: (a) professional staff; (b) skilled staff; and (c) unskilled staff.

The SUPERV module then assigns the total professional staff (excluding paraprofessionals) to a senior professional category in such a way that, wherever possible, there is at least one person to head each of the following: supervision and management (i.e., chief librarian), documentation and information services, reference, and technical processing. That is, if there is more than one professional staffmember in each of the above sections (as computed by the respective modules), then one in each is assigned to the senior professional category to head the section. If the computed professional staff value is less than one in any of these sections, then the computed professional staff value is upgraded to the senior professional category for that section.

The total staffing need for the library as computed and assigned to each of the sections is shown in table 2.

LISPA then presents another table of the computed staffing under each category of staff, together with the minimum and desirable qualifications and experience, as shown in table 3.

**Table 2**
Staff Required for the Library /Information Center

| Section | Sr. Prof | Prof. | Paraprof. | Skilled | Unskilled |
|---|---|---|---|---|---|
| Acquisition | | 1.0 | | 1.0 | 0.5 |
| Periodicals | | 1.5 | 1.5 | 3.0 | 1.5 |
| Technical | 1.0 | 1.0 | 2.0 | 0.5 | |
| Maintenance | | | 1.0 | | 3.0 |
| Circulation | | | 2.0 | | 3.0 |
| Reference | 1.0 | 1.0 | | | |
| Documentation | 1.0 | 5.0 | 6.0 | | |
| Supervision | 1.0 | 1.0 | 3.0 | | 1.0 |
| Total | 4.0 | 10.5 | 15.0 | 4.5 | 9.0 |

LISPA then indicates that it is necessary to further group the staff within each of the categories (especially the professional category) into a few levels or grades (grade I [entry-level], grade II, etc.) as per salary scales and provide for time-bound or performance-based promotions. It is also helpful to provide for rotation of at least the senior professionals to enable them to have a working knowledge of the different sections of the library. Also, the system indicates that for computation of staffing for future needs (say after three or five years), LISPA should be run with estimated values for the different periods.

## Limitations

LISPA does not include the computation of staffing for binding; printing; training of readers (users) and retraining of staff (e.g., for online and CD-ROM search); maintenance of machinery and equipment such as microcomputers, communication networks such as LANs, reader/printers for microforms, audio and video equipment, and photocopiers; or building maintenance. Moreover, no provision has been made in the current version to display in adjacent columns the data keyed in or assumed and the resultant computed staffing for each section categorywise, so that comparison can be easier. To have such a record, any memory-resident "notepad" utility can be used. Modifications made by LISPA users to system defaults are stored only for the duration of the

**Table 3**
Staff Required for the Library/Information Center—By Category

| Category of staff | Number of persons |
|---|---|
| *Chief of Library/Information center*<br>M.A./M.S. + M.L.I.S./A.D.I.S. + 10 years experience (Ph.D desirable) | 1.0 |
| *Senior professional*<br>M.A./M.S. + M.L.I.S./A.D.I.S. + 6 years experience | 3.0 |
| *Professional*<br>M.A./M.S. + M.L.I.S./A.D.I.S. (2 years experience desirable) OR<br>B.A./B.S. + M.L.I.S./A.D.I.S. (3 years experience desirable) OR<br>M.A./M.S. + B.L.I.S./Dip.L.I.S. (4 years experience desirable) OR<br>B.A./B.S. + B.L.I.S./Dip.L.I.S. (5 years experience desirable) | 10.5 |
| *Paraprofessional*<br>Grade 10/12 + one year experience in a library or Certificate in L.I.S. | 15.0 |
| *Skilled staff*<br>Grade 10/12 + Typing/ Stenography/ Accounts | 4.5 |
| *Unskilled staff*<br>(ability to read and write) | 9.0 |

*Note:* The qualifications and experience given above are those prevailing in India, which may not be acceptable to all.[23] However these can be taken as an indication of the requirements for the different staff categories.

session. Although a session can be rerun without quitting the system, modifications are lost once the user quits LISPA.

## Software and Hardware

The programs are written in CBASIC language, with the different modules linked by CHAINing. LISPA will run on any IBM PC/AT or compatible with 512K RAM, a 1.2MB floppy drive using MS-DOS 3.1 and higher. A Visual Basic (Windows) version is under preparation. The modules will be tested and modified in the light of the experience gained. It is hoped that space, equipment, and financial-planning modules will be added later to make LISPA a model for both planning and teaching of planning of libraries.

## Availability of LISPA

The present version of LISPA is available for free. Copies can be obtained from F. J. Devadason by sending a 720K floppy in a self-addressed disk mailer with $5 (US) to cover airmail postage.

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