

SELECTION OF HARDWARE & SOFTWARE -EXPERIENCES OF AUTOMATION AT I.G.M. LIBRARY, UNIVERSITY OF HYDERABAD

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ABSTRACT

Discusses in detail the hardware and software requirements for library automation with criteria for selection of hardware and software. Qualities of a good software package and precautions to be taken while selecting particular software is discussed in detail. Hardware and software experiences at the I.G.M. Library with services available, proposed plans, user reactions to the automation are elaborated.

1. INTRODUCTION

Among the nineteenth century inventions computers have revolutionized every walks of life. No other area in recorded history has experienced so many transformations and such dynamic/radical changes as computer field did. Information Technology (IT) also has undergone changes with rapid strides. Technological developments within few years become outdated or obsolete due to the rapid developments in the field of computers. Nobody should underestimate the Digitalised Information Technology development which is going to swarm all over the world.

Technology is rapidly changing the peoples knowledge seeking pattern. According to Chuck Fenton "For all the futuristic appeal, electronic capabilities may actually enhance a libraries' role as the centre of learning in community". University libraries work as a hub in university network. By networking into national and international networks, allow the faculty, researchers and students to reach international and national databases, which will allow them to wrestle with raw data and stretch their research skills.

University libraries must position themselves as technology leaders, providing the highest quality in information access to their faculty and students. Recent trends in Information Technology has completely transformed the Information Industry. Technological innovations helped the Information Technology Industry to develop expeditiously. The technology supporting networked electronic

information resources seems likely to produce architectural change in the Information Industry and particularly in resource sharing.

Radical thinking of manual practices are necessary before going for the automation. Before any automation of library operations takes place, it is most difficult kind of team both to assemble and to make work effectively, and the kind requires the longest time to gain performance capacity. The environment should be such that it should help to determine what kind of work you do and the amount of satisfaction you derive from it. Its people who put computers to work. Its people working together who determine processing needs, provide input data, design processing procedures, select hardware and software, write computer programs if necessary and use processed output. With knowledge work growing up increasingly effective as it is increasingly specialized, teams become the work unit rather than the individual himself.

2. HARDWARE SELECTION

Hardware is the general name given to all the equipment which makes up the computer. The main point is that no matter what a computer looks like or costs, it works on the same lines. Computers as much less flexible than human being in how they handling information. If the basic systems are mess, computerising them is likely to make an almighty mess. The computers need additional devices to handle the data what we give them to process.

A good sense of judgment about future data processing needs is essential. The people in the management should decide on type of selection and the use of outside assistance, before entering into the configuration phase of computer. When procuring larger systems, use of experts assistance is advisable for all practical purposes. Reasonable deliberations and involvement of the people who can visualise the future should be involved before finalising the configuration, which will make the life of the management easy. Any selected equipment should satisfy the purchaser to the possible maximum extent if not to the full extent. Purchaser should look for leverages to apply pressure for better vendor services and other support. Do not push too hard lest relationship vitiates.

Computing power is not only the criteria when selecting new systems. Old computers should be able to be used with the new configuration. The selection committee should take care of this point before finalising the deal. Ensure that newly acquired computers should support all the software available in the market and also the existing software in use. Harmony should be the major selection criteria. A fast Central Processing Unit(CPU) backed up by good Random Access Memory (RAM) is always advisable. Considering the growth of the software and data with every development of information technology, the purchaser should always look for the higher disk storages than required. Another thing to keep in mind is always the additional costs for the incremental storage of hard disks are very less when compared to buying another new hard disk. Marketing people may say many things to market their product but the purchaser should take all precautions to get the best out of the market. Nearly 25% of the ability of the computer depends on the RAM you choose. Cache memory is another feature *which enhances the computer's performance by another 10%*. Additional capacities are always welcome to meet either future growth or unexpected peak loads.

Coming to graphics monitor-more the size the better will be the resolutions and better viewing. Video refreshing rate should be good on a monitor when we want full page color graphics. For local networks and intelnet access high speed UART-16550 serial port is always advisable.

Expensive, inefficient and badly managed computers are much commoner than most people realise. Not surprisingly, the people incharge of them tend to be reticent about the costs involved and efforts to be put in. For any hardware we buy, should have the capability to integrate with the latest equipments may be with little or no modifications.

For the selection criteria we should have the following minimum requirements.

- Hardware capacity and performance
- Software performance
- Vendor support and viability
- Application software availability
- Costs (development, installation and operation)
- Configuration flexibility and expansion capability
- Compatibility with the present computer system (if any)
- Documentation available
- Delivery date

Due to the complex nature of the hardware and software capacity and performance evaluation, special attention may be taken by the selection committee and evaluate through published reports and performance evaluation techniques. Appropriate care should be taken while integrating computers and technology into libraries during expansions and renovations.

The following points may also be kept in mind before going in for any automation.

2.1 - PHYSICAL SITE PREPARATION

- Air conditioning
- Electrical power requirements (wiring also)
- Data cabling
- Fire protection equipment
- Furniture, fixtures, storage space & floor changes
- Provisions for computer room security

2.2 - HARDWARE RELATED CONSIDERATIONS

- *Transportation & local cartage of new/old equipment*
- Installation charges of new equipment
- Estimations of additional storage/backup media
- Insurance charges
- Any other incidental charges

2.3 - EDUCATION & TRAINING

- Training of library personnel

2.4 - DATA CONVERSION COSTS

- Data entry time
- Conversion of backlog/manual catalog cards to machine readable form
- Machine rental of transcription devices used solely for transcription purposes.
- Application program conversion

2.5 - RECURRING EXPENDITURE

- Depreciation
- Maintenance
- Hardware rental lease
- Telephone
- Operating supplies (Stationery, Tapes etc.)
- Purchased services

3. SOFTWARE SELECTION

Software is defined as "a set of computer programs, procedures, rules and associated documentation concerned with the computer operations" by John E. McNamara. Software enables people to control the operations of computer. Considerable deliberations should take place before selecting any application software. The application software should deal accurately the program capabilities of the needs and requirements of the users. Acquire a software which runs on a multiuser system.

Before acquiring any application software we should *look into the following* -

Identify department-wise tasks to be performed and goals to be achieved.

Collect and analyse the current data processing operations in the organisation and also in other organisations.

Analyse some of the running packages in other organisations.

Talk to the vendors regarding customisation which is very essential for any application software.

Cost of acquiring, implementation, maintenance and support of the package.

Training & Modification costs.

Tangible & intangible benefits and savings.

Throughput, performance volume, timeliness and accuracy of output.

Application software, for carrying out the total library operations, can be acquired in three ways.

1. Buying readymade packages
2. Develop in-house
3. Ask a software agency to develop

3.1 DEVELOPED BY SOFTWARE AGENCY

In this type of acquisition it is difficult to get additional services.

Advantage during negotiations only and that is the best time for negotiations.

Group negotiations to avoid conflicting commitments.

Written agreements are advised.

Do not forget to review the contract with your legal department.

3.2 DEVELOPED IN-HOUSE

Costs are high compared to purchase packaged software.

This is because vendor can spread costs across many users.

The maintenance and corrective changes of in-house developed software can be 30% of original development charges.

3.3 BUYING READYMADE PACKAGES

Maintenance and corrective charges in purchased package will be around 5% to 10%.

Modifications/development of software is done by the vendors of software on regular feed back from customers. Where the requirements are common in nature, it is easy for them to modify/adjust the package.

Always buy package from a reputed vendor.

Documentation will be good.

Training & support facilities will be available.

In an in-house development environment, it will be difficult for the programmers to carry out someone else's software. Generally another problem in in-house development is there will be no second level programming team to backup the first level. According to J.E. Rowley "**A tried and tested package is likely to be much easier to implement than an in-house package. The package should be robust, and supported by documentation, user groups and other users, training, help desks and maintenance arrangements. Such support is especially crucial for the newly literate information manager, but should also be welcomed by all who have to manage a computer system**".

3.4 QUALITIES OF GOOD SOFTWARE

- Performance :** Should be able to handle large files at peak loads without crashing. They should be quick enough to handle the online operations.
- Integration :** The software should be able to adopt the already existing data which is in machine readable form.
- Customisation :** Customisation to the user needs must be available. In some cases user also can adjust to the package.
- Upgrading :** Upgrading costs should be spelt out very specifically since the systems will be developed further.
- Multiuser :** Always go for multi-user and multi-tasking environment.
- Networking :** Networking with the software should be possible. If not, in future it has to be provided and the costs involved should be spelt out.
- Support :** Adequate training, documentation and backup from vendor should be available.
- Price :** Purchase price, upgradation costs and support pricing, Annual Maintenance Charges to spelt out.

4. BARCODE TECHNOLOGY

Barcode technology is nothing but changing the data into the black and white stripes which in turn will be read by the Optical Scanners. This will facilitate in reducing the human errors. This is almost foolproof technology. Though it is not widely used yet in the libraries but this is a technology which will improve the efficiency and speeding up of the operations like issues, returns and renewals at the circulation counters. It will also help in taking the inventory of the books with some additional equipment to facilitate the books inventory faster.

Software plays vital role in printing barcode labels. One can use ordinary stationery or pre-printed labels also to print barcode labels. There are various ways to generate the barcodes. Dot matrix printers, laser printers and special printers like Thermal Transfer Printers are used to print barcode labels.

5. SOFTWARE & HARDWARE EXPERIENCES AT I.G.M. LIBRARY

YEAR	HARDWARE / FACILITIES	SOFTWARE	STAFF
1987	- 80286 PC/AT with 33 Mhz - 4MB. RAM - 1.2 MB. Floppy Disk Drive - 80 MB. Hard Disk Drive - CGA Color Monitor - 300 CPS (9 pin) Printer - 2 VT-100 Terminals	- MS-DOS Operating System -dBASE III+	2 Persons (One with automation exposure)
1989	- 80286 PC/AT with 33Mhz. - 4 MB. RAM - 1.2 MB. Floppy Disk Drive * 210 MB. Hard Disk Drive - CGA Color Monitor - 300 CPS (9 pin) Printer - 2 VT-100 Terminals + 2 VT-100 Terminals + 2 Diskless PCs	- MS-DOS Operating System - dBASE III+ + Xenix Operating System + LIBSYS	3 Persons (One with automation exposure)
1990	+ Circulation went online With 2 VT-100 Terminals		
1992	* 80386 PC/AT with 33Mhz. - 4 MB. RAM - 1.2 MB. Floppy Disk Drive - 210 MB. Hard Disk Drive - CGA Color Monitor - 300 CPS (9 pin) Printer - 2 VT-100 Terminals - 2 VT-100 Terminals - 2 Diskless PCs	- MS-DOS Operating System -dBASEIII+ - Xenix Operating System - LIBSYS	5 Persons (Two with Computers exposure)
1993	+ 80486 PC/AT with 66 Mhz. + 8 MB. RAM + 1.2 MB. Floppy Disk Drive + 380 MB. Hard Disk Drive + 150 MB. Cartridge Tape Drive + Mono CGA Monitor + 8 Port Intelligent card + 3 VT-220 Terminals + 280 CPS.(24 pin)132 Col.Printer	+ AT & T Unix V.3.2 * AT&T Unix based LIBSYS	5 Persons (Two with Computers exposure)

Note : (1). + indicate addition
(2). * indicate upgradation

YEAR	HARDWARE/ FACILITIES	SOFTWARE	STAFF
1994	+ With same configuration our library was put on to the campus network + 1 VT-100 Terminal in Acquisition section + 1 VT-100 Terminal in Periodical section + 1 VT-100 Terminal in University librarian + 4 Connections were provided in Computer section. One was used as OPAC Terminal.		4 Persons (All were trained on computers internally.)
1995	+ DEC server with 150 Mhz. + 64 MB. RAM + 6 GB. Hard Drive + PATHWORKS + CD-ROM drive + 2.88 MB. Floppy Disk Drive + 4 GB. DAT Drive + 7 Drive CD-NET + 4 Multi Media PCs' + 13 Diskless 80386 PCs' + 80386 x 3 PCs' with Hard Disk + A4 size Flatbed Scanner + Hand Scanner + Laser Printer + 4x80 Col. (24 pin) Color Printers + 132 Col. (24 pin) Color printer + 132 Col. (24 pin) Mono printer + Barcode label (Thermal-transfer) printer + 2 CCD Scanners to scan barcodes	+ OSF/1 Operating system * OSF/1based *LIBSYS	5 Persons (All are exposed) Disk

Note : + indicates addition
* indicates upgradation

LIBRARY NETWORK DIAGRAM IS ON THE NEXT PAGE

Apart from the staff mentioned in the above table, all the professional library staff members are trained to handle various modules of LIBSYS package in all the sections of the library.

5.1 SERVICES AVAILABLE

- Online Catalogue access in the Library and across the Campus.
- Journals information from January 1995 is on the Network.

- Theses and dissertations information.
- Online Circulation operations with Barcode technology support.
- Online Periodical Kardex updation.
- Online Acquisition & Technical processing.
- 7 Drive (CDs') CD-NET access within the Library and across Campus Network.
- Multimedia facilities.
- Science Journal Holdings data in the machine readable form.

5.2 PROPOSED PLANS

- To update the Theses and Dissertations records with abstracts.
- Social Science Journal Holdings data in machine readable form shortly.
- To scan content pages of journals to put them on network, as part of CAS.
- To scan selected statistical information with the help of scanners and make them available to all the users over the network.
- CAS & SDI services.
- To conduct training programmes to other on library automation and trends.
- To help other libraries in their automation projects including creation of their databases.

5.3 USERS' REACTIONS ON OPAC AND NETWORK

Our users, consisting of faculty, research scholars, staff and students, reactions towards the Online Public Access Catalog and network are overwhelming. The terminals provided in the entrance lobby are always engaged and users are demanding for more and more services. Network users are also appreciating the efforts of our library in bringing the catalogue on to the network. With regard to the online serials information which we added on to the network, users reactions are encouraging. Most of the users are using OPAC terminals virtually abandoning the manual catalogue, which shows the easy accessibility of the automated

catalogue. We have not collected any formal feedback from our users about these services. The above observations are based on personal reactions from the users and observations at the OPAC terminals by the library staff.

We are inviting constructive suggestions towards the betterment of the existing services and to the new services. Our faculty members are suggesting ways to improve the facilities which are already provided like providing abstracts for the thesis, dissertation and project reports which we have put on the network.

6. CONCLUSION

It is always better not to confuse simple dreams with hardcore realities. The struggle to implement a computersied system may be long-term one and may be difficult but definitely not impossible. The current trends in IT suggest that in the near future all libraries must follow the automation trend. Otherwise they are going to fail miserably in their efforts to meet the growing information needs of the users. The libraries must gear up to exploit and cope with the new IT changes. The rapid changes in technology itself with new capabilities, enhancements and releases coming at a great pace, needs continuing enhancement of the equipment and skills. It is not the computers which are introduced into the working environment, but it is always the human ways of thinking, acting and communicating that requires the transformation. Computer manufacturers are finding more and more ways at making computers easier to be used by non-experts/novices. At the outset the organisation

should create an ideal environment in which people get encouraged and want to use computerised system and work towards achieving the organisation goals.

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