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IMPROVING THE EFFECTIVENESS

OF SMALL LIBRARIES AND

INFORMATION UNITS

Moduls of Training Courses 1988 / 89 / 90

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CONTENTS

COURSES FOR LIBRARIANS IN SMALL LIBRARIES

FOREWORD

BY PROF. P. HAVARD WILLIAMS

This publication is the outcome of a series of courses which are a result of the continued fruitful co-operation between the Deutsche Stiftung fur Internationale Entwicklung, which provides the financial backing, and a great deal of useful advice, and the University of Botswana, which provides the teaching and infrastructure. This is the second series of courses. The first which was devoted to the training of library assistants, which published as Introduction to Librarianship and Documentation.

This second series has been devoted to the education and updating of para-professional librarians in small special libraries, though those attending have been not been extensively from special libraries, and the contents of the chapters reflect the interests of a wider audience. One of the major problems of librarians in developing countries is their isolation. Isolation in a professional setting tends to limit horizons, and frequently make one feel that things are impossible to do, or even that they are hardly worth doing, particularly where the librarian is relatively junior to the clientele he or she serves and where life is dominated by series of shortages, both professional materials and the ordinary necessities of life.

These chapters both update the librarians and documentation

officers on the latest trends in thinking in librarianship
and Information science but, more important, they pour a
refreshing dose of clear, calm, common sense on contemporary
library practice and indicate how, with very simple means,
librarians and documentation officers can still get things
done and improve their service. For those worried about new
technologies, there is a very clear exposition of Computer
technology and its application to library and information
science, which should be helpful to those who feel inadequate,
were they to be faced with the possibility of having a
microcomputer to use. On the other hand the remaining modules
do not require the knowledge of computers, and give really
useful guidelines for contemporary practice.

By the time these modules are published, over a hundred
librarians from the region of Eastern and Southern Africa
will have benefited from them. For those who came, the
publication will serve as a useful reminder; for those
who were not able to attend, they will serve as a useful
professional reading.

Gaborone
June 1990

SECTION 1

INTRODUCTION TO INFORMATION TECHNOLOGY

INTRODUCTION TO COMPUTERS, OPERATING SYSTEMS & DATABASE SOFTWARE

(RADHAKRISHNAN AMBAT)

INTRODUCTION TO CDS/ISIS

(K.MOAHI)

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CONTENTS

INTRODUCTION TO

COMPUTERS, OPERATING SYSTEMS

AND DATABASE SOFTWARE

(RADHAKRISHNAN AMBAT)

1   COURSE INTRODUCTION

1.1 Age of Information Technology

This latter part of the 20th Century is aptly called the
'Age of Information Technology'. Technology, especially
developments in the fields of Computers and Communications,
is playing a very crucial role in the dissemination of
Information, in a way unimaginable a few years ago.

Computers located in one part of the world can 'talk' to and
access information stored in computers in other parts of the
world through telephone and satellite Communication links.
This has already revolutioned areas such as Airline
reservations and International Banking. Libraries and
Information Centres, by their very nature are potential

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benefeciaries of this technology. So far the benefits have
been restricted to large libraries and information centres
in the developed countries. However, developments in the
microprocessor field are changing this situation very
rapidly.

1.2   Effect on Small Information Centres

The role of a Library or Information Centre is to aquire,
manage and disseminate information to the population it
serves.   In most of the countries of the third world, the
majority of the population lives in the villages. They have
at best access only to small libraries. Access to modern
information technology for these institutions, therefore
means access to the benefits of this technology for the
majority of the population in these countries.

The role of Information in Development can not be
overemphasised and technological developments which have a
major impact in this area are bound to have a catalystic
effect in all other areas of development.

As we shall see below, various developments in the field of
Computers and Communication technology are bringing it's
benefits within the reach of small organisations with
limitted financial resources, such as those in the
developing countries.

1.3 Developments Favouring use of Computers in Small Libraries and Information Centres

(a) Increased Power and Capacity of Modern Micro-Computers: The modern micro-computers are becoming more and more powerful, and can now do what only large 'mainframe' computers could do in the past.

(b) Lowering Costs:- The rapid advances in the field of 'Micro-Electronics' technology has brought down the cost of the computers, bringing them within the means of even small organisations.

(c) Ability of these Machines to communicate with other Computerised Data Banks located at other National and International Information Centres and Libraries.

1.4 Course Objectives:

One factor which is likely to restrict or hamper potential use of this technology by these organisations, notwithstanding the above developments, is the lack of know-how on the part of these potential users on how to exploit this new medium.

This course is therefore intended to introduce the participants to the necessary skills in this area and has the following specific objectives:

1. Introduce the participants to basic Computer Concepts and fundamentals of Hardware and Software.

2. Expose them to a popular Micro-Computer in the market viz, the IBM PC.

3. Introduce them to the basic skills required to use the IBM PC.

4. Explain the fundamentals of the Disk Operating System (DOS) for the IBM PC and the DOS Commands.

5. Discuss basic concepts of a Database Software, with specific reference to the dBASE3 and show how this software can be used to develop and implement useful Systems.

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2. INTRODUCTION TO COMPUTERS

We shall begin with a brief review of developments that took place in the Computer field over the years, to give the student a historical perspective of this relatively new technology.

2.1 Developments in the Computer Field: From the 'ABACUS' to the 'Micro-chip'

Ancient Chinese   –   Used the 'Abacus'- a simple mechanical device – for calculations. It is used even today.

1801 AD   –   Frenchman Joseph Jacquard invented the Punched card loom. The Punched card was to later become a popular input medium for computers.

1890   –   American Dr. Herman Hollerith developed the Punched card machine to processs American Census Data. The company Hollerith started later became the IBM- the giants of the Computer World today.

1946   –   Dr. Von Neuman, A Hungarian mathematician settled in USA Postulated the

Principles of stored Program Computers. This led to the birth of modern Computers.

1947   —   EDVAC, the first stored Program
                            Computer built.

1950   —   Start of the 'Computer Era' with the
(1st Generation   mass production of Computers (1st
Computers 1950-59)   generation using vacuum Tubes).

1959-1965   —   II Generation Computers using
                            Transister Technology - reduced cost,
                            size, increased speed.

1965-1975   III Generation Computers used
                            Integrated circuits (IC) Technology.
                            Further reduction of costs, increase
                            in Computing power and reduction in
                            size.

1975-?   IV Generation Computers using Large
                            and Very Large Scale integration
                            (VLSI).   Birth of micro-processors.
                            Vast increase in Computing power, Cost
                            & Size reduction.

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Future?   V Generation Machines with artificial
                           intelligence, Expert Systems etc. still
                           in the infant stages of development,
                           promises an exciting future for
                           Computer Technology.

2.2 COMPUTER CONCEPTS

A Computer can be simply defined as a piece of machinery which can process 'input' data according to a set of instructions called the 'Program' stored inside to produce a desired output.

A modern Computer system consists of 2 broad components:

(a) The Hardware units.

(b) The 'Software' or the 'Programs' that make The 'Hardware' work.

2.2. 1. Hardware

The 'Hardware' Consists of all the physical devices connected together making up the Computer system. These are normally the 'Central Processing Unit'(CPU), the 'Input' Devices , the 'Output' Devices and the Communication Devices that connect them together.

Typically a Computer system architecture can be illustrated by the diagram in the following page:

```
┌─────────────────┐     ┌──────────────────────┐     ┌──────────────────┐
│                 │     │CENTRAL PROCESSING    │     │                  │
│ INPUT DEVICE(S) │────▶│                      │────▶│OUTPUT DEVICE(S)  │
│                 │     │UNIT (OR CPU)         │     │                  │
│                 │     │                      │     │                  │
└─────────────────┘     └──────────────────────┘     └──────────────────┘
```
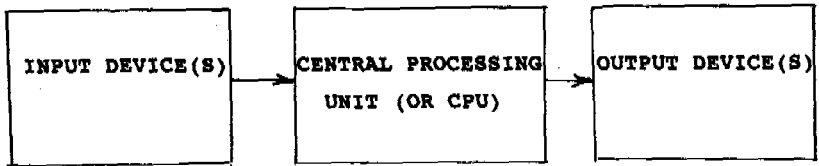
Their functions are as follows:

CENTRAL PROCESSING UNIT (OR CPU):

It may be said that the 'Brain' of the Computer
System is the Central Processing Unit (or the CPU as it is
generally known) which has the electronic circuitry to
carry out Arithmetic, Logic and Data Moving operations.
This unit also houses the 'Internal Memory' (RANDOM ACCESS
MEMORY or RAM). Data input into the CPU is processed
according to instructions stored in the memory. These
instructins constitute a 'Program'. The result of
Processing is sent to 'Output' devices.

INPUT DEVICES:

Input devices are required to feed data into the computer.
Various kinds of devices are used for this purpose.
Important among them are: Keyboards, Punched Card Readers,

Magnetic Tape or Disk Units, Paper Tape Readers, Magnetic
and Optical Character readers etc.

OUTPUT DEVICES:

A variety of devices are available for Computer output.
While the most Common of them is the Printer, devices such
as Card Punches, Magnetic Tape and Disk units, VDUs, Paper
Tape units etc. are also frequently used for output.

COMMUNICATION DEVICES:

The above hardware units 'Communicate' or transmit and
receive information between themselves through the use of
various communication devices. Briefly, equipment such as
Device Controllers, Multiplexers, Modems, telephone lines
and Satellite links are used for this purpose.

The 'Configuration' of a Computer System describes how a
particular system is made-up incorporating one or more of
such input-output devices. A Typical configuration may look
as illustrated in the diagram in the following page.

A TYPICAL COMPUTER SYSTEM

CONFIGURATION

INPUT DEVICES

| Key Boards | Magnetic Disk(s) | Magnetic Tape(s) | Card Reader(s) | etc. |

```
                    ┌─────────────────────────────┐
                    │                             │
                    │        CPU   ┌──────────────┤
                    │              │ Memory (RAM)  │
                    │              │              │
                    └─────────────────────────────┘
```

| Printer(s) | Magnetic Disk(s) | Magnetic Tapes(s) | Visual Display Units(VDU) |

OUTPUT DEVICES

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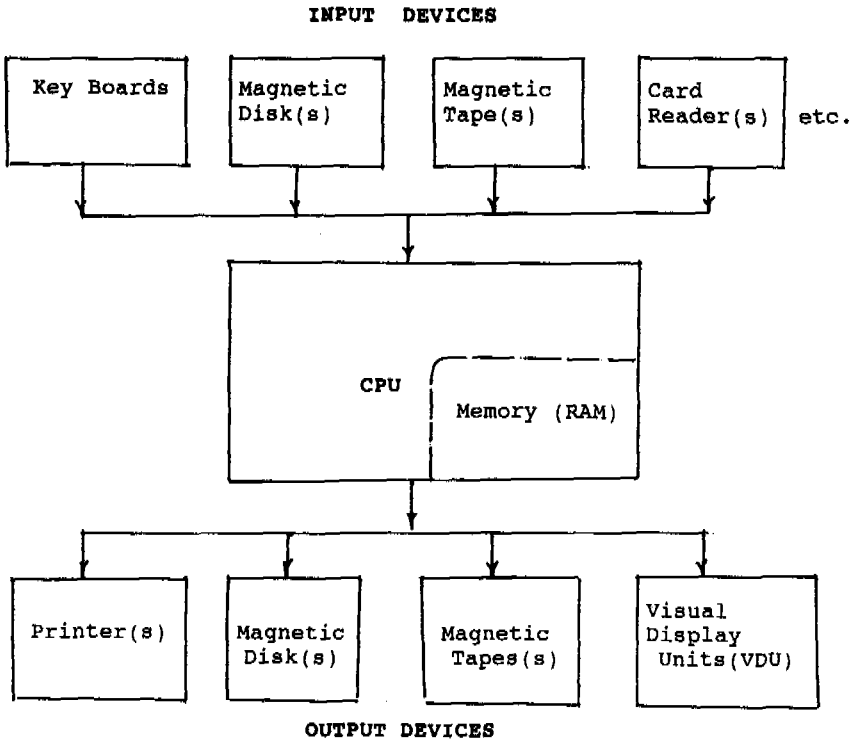
2.2 2. SOFTWARE:-

The Hardware units cannot by themselves do any useful work.
The Component which makes the computer do what we want it to
do is the 'Software' or the 'Programs'. In other words, it
is the 'Software' which gives 'Intelligence' to the
Hardware and make it capable of performing complex tasks.
The 'Software' can be divided into 2 groups:-

        (1)   The 'Operating System' Software.

        (2)   The 'Application' Software.

THE 'OPERATING SYSTEM' SOFTWARE (SYSTEMS SOFTWARE)

In a modern Computer, the 'Operating System' has many
functions. Consider a large computer system with many
terminals through which many users access the computer at
the same time. This system has probably a number of input,
output and storage devices which are shared by these various
users. The computer is able to attend to the many users
'simultaneously' because it is very fast and can create the
impression of serving all of them at the same time by switch
ing between these users in fractions of a second.
However in reality it can only do one thing at a time.

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In such an environment an 'Operating System' assumes a
supervisory role deciding on the following (among others):

(1) Since the Computer can really do only one thing at a
     time, who should be given access to the system at a
     particular moment and in what order of priority.

(2) How to prevent one user from illegally accessing or
     tampering with confidential data belonging to another
     user.

(3) Since many devices such as magnetic disks, tapes and
     printers may be shared by different users, how to
     allocate these 'Resources' to the users and resolve
     clashing demands.

(4) How to allocate main memory (RAM) to different users'
     programs etc.

In short, the 'Operating System' has to supervise and manage
internal processes and resources of the system. This in
fact is acheived through a large number of programs for dif-
ferent functions such as those listed above. All these
programs together make up the 'Operating System'. The
'Operating Systems' in other words acts as an 'interface'
between the 'user' and the 'Hardware' - providing many
facilities in addition to the above 'supervisory' role,
such as Language Compilers, File handling Utilities etc.
which make it easy for the user to work with the computer.

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THE APPLICATION SOFTWARE

The 'Application software' on the other hand are programs which, as the name implies, processes various 'Applications' for the user of the computer system. These may be Pay-Roll preparation, Inventory Control, Airline Ticket Reservation, Financial Accounting, Data Base programs, spread sheet programs, Library management etc.

Application programs interact directly with the user of the computer system on the one hand and on the other hand with the 'operating system' to gain access to the 'Resources' of the computer. This can be illustrated as follows:-
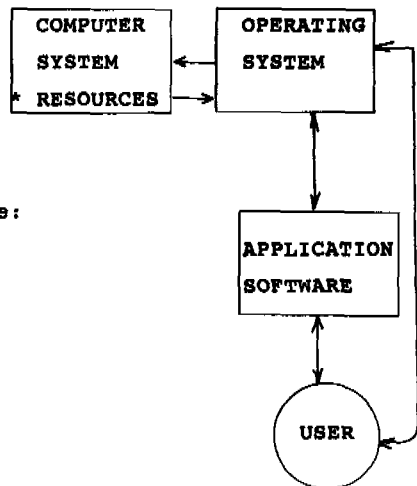
The resources are:
Memory (RAM)
Disk space
Tapes
Printers
Programs etc.

2.3 STORAGE OF INFORMATION IN A COMPUTER:

We saw that Punched Cards, Paper tape, Magnetic tape,
Magnetic Disk etc. are used to input and output data to or
from the Computer. These are called 'External Storage
Media' for information storage.

They are termed 'External' because these devices are not
part of the Central Processing Unit of the Computer System.

The Memory (RAM) on the other hand is the Internal storage
Medium, which means that it resides within the CPU and is
part of it.

The following illustration gives more details of this
categorisation, as well as their respective usage:

STORAGE MEDIA

INTERNAL
(RANDOM ACCESS MEMORY)

EXTERNAL

USED FOR

USED FOR

STORING PARTS OF
OPERATING SYSTEM
PROGRAMS WHEN THE
COMPUTER IS
RUNNING

STORING APPLICATION
PROGRAMS THAT ARE
RUNNING

AS WORKING
STORAGE
FOR THE
PROGRAMS
THAT ARE
RUNNING

PERMANENT
STORAGE FOR
COMPLETE
'OPERATING
SYSTEM' PROGRAMS

STORAGE FOR
'APPLICATION
PROGRAMS'

STORAGE FOR
USER DATA
FILES

STORAGE
FOR
LANGUAGE
COMPILERS
ETC.

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2.4 COMPUTER DATA REPRESENTATION:

We have learnt about the various media on which data can be stored for access by a Computer. But how is the data stored?

We shall now take a brief look at the ways of representing data in storage media.

Binary System: Information is stored in the computer in pure Binary or a modified form of Binary numbers. Binary numbers, as the name suggests have a base of '2' and each digit can take only 2 values - '0' or '1'. Compare this with the 'Decimal' system where a base of '10' is used and each digit can take '10' values - from 0 to 9.

Without going into the arithmetics of Binary system, we shall see the Binary equivalents of some Decimal numbers which should make the concept clear.

Decimal Number	Binary Equivalent
1	1
2	10
3	11
4	100
5	101
6	110
7	111
:	
:	
10	1010
11	1011
:	
20	10100 etc

As can be seen from the above, we can represent any decimal number in Binary form, by a string of 0's and 1's.

As a number is represented in Binary System by a string of only '0's and '1's, it is easy to translate this to states of physical devices such as the state of a transistor device as 'Non-Conducting' or 'Conducting' representing '0's and '1's respectively - thus providing the basis for 'Electronic' storage of information.

'BYTE':

In most modern computers today, the basic unit of data is a 'Byte' which consists of 8 Binary digits (or BITS).

A 'byte' (or 8 binary digits) is adequate to represent 2 numeric decimal digits or 1 alpha-numeric character such as a letter of the alphabet or a special character or a numeric digit stored in character form. How this is done is explained below:-

CODING STRUCTURE:

The actual Coding method used to represent numeric or character digits in a byte can be different in different Computers. But 2 common forms of Coding are the "American Standard Code for Information Interchange" (ASCII) and The "Extended Binary Coded decimal Interchange Code" (EBCDIC).

The table in the following pages gives the Binary number in

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8 BITS[1] (one Byte), the equivalent Decimal representation, the equivalent Hexa decimal representation[2] and the character represented by this Binary number - in ASCII method.

For example the character "+" is represented in ASCII by the Binary String "0101011" whose decimal value is "43" and Hexa decimal representation is "2B".

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[1] The ASCII form actually uses 7 bits to represent a Byte or Character, although the Extended ASCII set uses 8 bits to represent a Byte. The leftmost bit is therefore omitted in the normal ASCII representation.

[2] Hexa Decimal representation is a convenient way of writing long strings of Binary Numbers in a coded short form using Base 16 Arithmetics.

ASCII and Hexadecimal
Conversions

ASCII stands for American Standard Code for Information
Interchange. The code contains 96 printing and 32
nonprinting characters used to store data on a disk.
The 2 Tables in the following pages defines ASCII Symbols
and lists the ASCII and hexadecimal conversions. The table
includes binary, decimal, hexadecimal, and ASCII
conversions.

ASCII Symbols

Symbol	Meaning	Symbol	Meaning
ACK	acknowledge	FS	file separator
BEL	bell	GS	group separator
BS	backspace	HT	horizontal tabulation
CAN	cancel	LF	line_feed
CR	carriage return	NAK	negative acknowledge
DC	device control	NUL	null
DEL	delete	RS	record separator

DLE	data link escape	SI	shift in
EM	end of medium	SO	shift out
ENQ	enquiry	SOH	start of heading
EOT	end of transmission	SP	space
ESC	escape	STX	start of text
ETB	end of transmission	SUB	substitute
ETX	end of text	SYN	synchronous idle
FF	form_feed	US	unit separator
		VT	vertical tabulation

ASCII Conversion Table

Binary	Decimal	Hexadecimal	ASCII Character
0000000	0	0	NUL
0000001	1	1	SOH (CTRL_A)
0000010	2	2	STX (CTRL_B)
0000011	3	3	ETX (CTRL_C)
0000100	4	4	EOT (CTRL_D)
0000101	5	5	ENQ (CTRL_E)
0000110	6	6	ACK (CTRL_F)
0000111	7	7	BEL (CTRL_G)
0001000	8	8	BS (CTRL_H)
0001001	9	9	HT (CTRL_I)
0001010	10	A	LF (CTRL_J)
0001011	11	B	VT (CTRL_K)
0001100	12	C	FF (CTRL_L)
0001101	13	D	CR (CTRL_M)
0001110	14	E	SO (CTRL_N)
0001111	15	F	SI (CTRL_O)
0010000	16	10	DLE (CTRL_P)
0010001	17	11	DC1 (CTRL_Q)
0010010	18	12	DC2 (CTRL_R)
0010011	19	13	DC3 (CTRL_S)
0010100	20	14	DC4 (CTRL_T)
0010101	21	15	NAK (CTRL_U)
0010110	22	16	SYN (CTRL_V)
0010111	23	17	ETB (CTRL_W)
0011000	24	18	CAN (CTRL_X)
0011001	25	19	EM (CTRL_Y)
0011010	26	1A	SUB (CTRL_Z)
0011011	27	1B	ESC (CTRL_[ )
0011100	28	1C	FS (CTRL_\ )
0011101	29	1D	GS (CTRL_])
0011110	30	1E	RS (CTRL_^)
0011111	31	1F	US (CTRL__)
0100000	32	20	(SPACE)
0000001	33	21	!
0000010	34	22	"
0100011	35	23	#

0100100	36	24	$
0100101	37	25	%
0100110	38	26	&
0100111	39	27	'
0101000	40	28	(
0101001	41	29	)
0101010	42	2A	*
0101011	43	2B	+
0101100	44	2C	'
0101101	45	2D	-
0101111	46	2E	.
0101110	47	2F	/
0110000	48	30	0
0110001	49	31	1
0110010	50	32	2
0110011	51	33	3
0110100	52	34	4
0110101	53	35	5
0110110	54	36	6
0110111	55	37	7
0111000	56	38	8
0111001	57	39	9
0111010	58	3A	:
0111011	59	3B	;
0111100	60	3C	<
0111101	61	3D	=
0111110	62	3E	>
0111111	63	3F	?
1000000	64	40	@
1000001	65	41	A
1000010	66	42	B
1000011	67	43	C
1000100	68	44	D
1000101	69	45	E
1000110	70	46	F
1000111	71	47	G
1001000	72	48	H
1001001	73	49	I
1001010	74	4A	J
1001011	75	4B	K
1001100	76	4C	L
1001101	77	4D	M

Binary	Decimal	Hexadecimal	ASCII
1001110	78	4E	N
1001111	79	4F	O
1010000	80	50	P
1010001	81	51	Q
1010010	82	52	R
1010011	83	53	S
1010100	84	54	T
1010101	85	55	U
1010110	86	56	V
1010111	87	57	W
1011000	88	58	X
1011001	89	59	Y
1011010	90	5A	Z
1011011	91	5B	{
1011100	92	5C	\
1011101	93	5D	}
1011110	94	5E	^
1011111	95	5F	<
1100000	96	60	'
1100001	97	61	a
1100010	98	62	b
1100011	99	63	c
1100100	100	64	d
1100101	101	65	e
1100110	102	66	f
1100111	103	67	g
1101000	104	68	h
1101001	105	69	i
1101010	106	6A	j
1101011	107	6B	k
1101100	108	6C	l
1101101	109	6D	m
1101110	110	6E	n
1101111	111	6F	o
1110000	112	70	p
1110001	113	71	q
1110010	114	72	r
1110011	115	73	s
1110100	116	74	t
1110101	117	75	u
1110110	118	76	v
1110111	119	77	w
1111000	120	78	x

Binary	Decimal	Hexadecimal	ASCII
1111001	121	79	y
1111010	122	7A	z
1111011	123	7B	{
1111100	124	7C	:
1111101	125	7D	}
1111110	126	7E	~
1111111	127	7F	DEL

2.5 USING A COMPUTER

It was stated earlier that the Computer Hardware by itself
cannot do any useful work. We need to 'Program' the
Hardware for this purpose. A 'Program' is a set of
instructions in a language the computer can understand and
to be executed one by one. This 'Program' has to be in the
internal memory (RAM) of the Computer while being executed.
There are various ways in which you can 'Program' a Computer
to do useful work. We shall examine the most important of
these ways in their increasing order of Complexity.

(a) USE OF READY MADE "PROGRAM PACKAGES":

Use of 'Program Packages' is very popular today,
especially on the micro_computers. These are 'suites'
of programs designed to do specific jobs such
as preparation of salary Bills, Financial Accounting,
Statistical routines, Library administration etc.
Buying a Package, if you can find one for your specific
need, is the easiest and quickest way of setting up
your programs. However by their very nature,
'Packages' are 'general' and you may have to adjust
yourself to the capabilities of the 'Package'.

Some of the common packages available on micro are the
LOTUS 123' for spread sheet applications, 'PEGASUS' for
Accounting, 'SPSS' for statistical purposes, 'MATLAB'
for Mathematical and WORDSTAR for Word Processing
applications.

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(b) **DATA BASE SOFTWARE**

'Data Base' Software refers to special Programs
which can be used to Define, Store, Retreive and
Manipulate data.   There are various types of
'Data Base' software in use in large to Micro_
Computers.   Depending upon the technique used in the
design of the 'Data_Base', they are categorised as
'Relational', 'Network' or 'Hierarchial' models.

The 'DBASE 3' software which we are going to see in
greater detail later in this course is a 'Relational'
model.   It essentially means that data is stored in a
tabular form of columns and rows.

Using a 'Data Base' software you can develop 'programs'
for an application such as say 'Personal Information
System' or 'Library Management' or 'Payroll'.

This also means that you have to learn the particular
'Data Base' language before you can 'Program' an
application.   Hence it is more complex and time
consuming than using Packages.

(c) **PROGRAMMING LANGUAGES**

'Data Base' Languages also can have their limitations.
If you are developing a complex application for which
no 'package' is available in the market, perhaps your

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only alternative is to develop your own "programs' in
one of the languages known as 'Higher level'
languages.[3] In this connection it would be useful to
understand the following concepts and terminologies
first:

SOURCE PROGRAMS: A program written in a programming
language such as the 'Higher level language' is called
a 'SOURCE' program. The 'SOURCE' programs cannot be
understood by the Computer in its original form and
needs to undergo a process called 'COMPILATION' or
"INTERPRETATION" before they can be executed by the
Computer.

OBJECT PROGRAM:

The process of 'Compilation' converts a 'SOURCE'
language program into the 'MACHINE' language of the
computer, which can be understood by it. This
'MACHINE' language program is generally referred to as
the 'OBJECT PROGRAM'.

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[3] It should be noted in this connection that there is also
another category of Programming languages known as 'Lower Level'
or 'Assembly ' Languages. These are not discussed here as it is
unlikely that today's computer users will ever need to use them.
These are more difficult to Program in and use than other
languages and are used only by specialists in Software.

PROGRAMMING LANGUAGES:

Some of the most popular 'Higher Level Programming Languages' are the following:-

(1) BASIC   (Beginners All purpose Symbolic
               Instruction Code).

(2) COBOL   (Common Business Oriented Language).

(3) FORTRAN   (Formula Translation Language).

(4) PL_1   (Programming Language _ 1).

(5) RPG   (Report Program Generator).

(6) ALGOL   (Algorithmic Language).

(7) PASCAL

(8) C Language

Some of these languages, such as BASIC, FORTRAN, ALGOL etc are more oriented to programming for Scientific/Engineering Problems.

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Others such as COBOL and RPG are suitable for programming Commercial/Business Applications.

PL_1, PASCAL etc are used in both environments.

The C Language is commonly used by Software Programmers for Systems Programming which refers to the development of Compilers, Software Packages etc.

NATURAL LANGUAGES

These are languages such as the 'Query Languages' available with 'Database' software and are similar to spoken languages in construction. Though their usage is restricted to areas such as above at present, these languages hold the promise of making the job of Programming much easier than what it is today.

2.6 MICRO COMPUTERS AND MICRO SOFTWARE:

The 1980s have seen a revolution in the computer field with the advancement of the 'Micro Computer'. These are in fact computers built around a 'micro_processor. The following general features characterise micro_computers:_

1.   They are generally 'single work_station' machines with one monitor (VDU) and one Key Board connected to the machine.

2.   They have one or 2 diskette drives and perhaps a hard_ disk drive of small capacity compared to Mainframes (10_100 Mega Bytes), though higher capacity drives are coming into market now.. Some use cassette_tape drives also.

3.   Relatively low speed matrix or daisy wheel printers are used.

SOME OF THE POPULAR MICRO COMPUTERS IN THE MARKET TODAY:

IBM PC	COMPAQ
IBM PS/2	VICTOR SIRIUS
APPLE PC	ICL ELF
COMMODORE	SPERRY MICRO
BBC	SINCLAIR SPECTRUM
ESPSON PC	

Most of the micro computers in the market today are built
around 'micro processors' manufactured by companies such as
the INTEL and MOTOROLA Corporations of USA. The IBM PC and
IBM PC Compatibles which are very popular are built around
the INTEL 8086/8088 series of micro processor. The more
powerful PC/ATs are built around the 80286/386 or even the
super-powerful 80486 micro-processor chips.
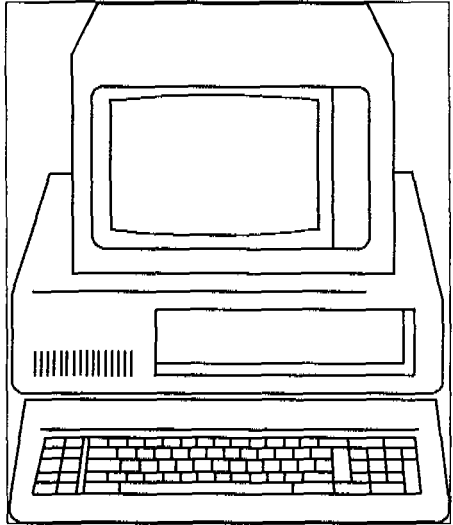
THE MICROCOMPUTER

The figure above illustrates the parts of a typical
MICROCOMPUTER or PERSONAL COMPUTER (PC) as it is often
called.

The top unit is the MONITOR or VISUAL DISPLAY UNIT (VDU)

In the middle is the SYSTEM UNIT which consists of the CPU,
the disk drives and control devices for other equipment
connected to the Computer, such as printers and mouses.

At the bottom is the KEYBOARD for data entry.

MICRO SOFTWARE

OPERATING SYSTEM:

The most popular operating system software used on the
INTEL based micros is the MS_DOS operating system. This was
developed by the Micro soft corporation, specifically for
the INTEL 8086/8088 based micros.

APPLICATION PROGRAMS:

Users of Micros rely on micro_software packages for much of
the Application Software run on them. Some of the most
popular packages available today for Micros are listed
below:

(1)	dBASE 3 dBASE 3+ ORACLE	_	Data Base software
(2)	WORDSTAR WORDPERFECT	_	Word Processing "
(3)	LOTUS 1_2_3 MULTIPLAN EXCEL	_	Spread Sheet "
(4)	ACCPAC PEGASUS	_	Accounting "
(5)	SPSS PC STATPAC	_	Statistical "

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(6) MICROLIBRARY   Library
     CALM   —   Automation   "

(7) HARVARD GRAPHICS-   Graphics work

(8) ALDUS PAGEMAKER —   Desktop Publishing

     etc.

REVIEW QUESTIONS:

1.   What do you understand by the terms 'Hardware' and 'Software'?

2.   What are the typical Hardware Components of a Computer System?

3.   Explain the term 'Software'. Distinguish between 'Systems' and 'Application' Software.

4.   What is a 'Program'? Explain the difference between 'Source and 'Object' Programs.

5.   Why are 'Software Packages' very popular today? Give examples of some of the popular packages in the market.

3.   OPERATING SYSTEMS: DOS

The 'Disk operating system' for INTEL 8086/8088 micro_
processor based machines, developed by the Micro Soft Corpn.
of USA has proved to be a very popular operating system
software for Micro Computers. 'DOS' as it is commonly
known, has a number of facilities which makes it easy to use
the micro.

Some of these are:_

(a)   Disk and File Management Facilities (Formatting Disk,
      Creating and Deleting Files etc).

(b)   Availability of 'utilities' to edit, sort and merge
      files.

In the following pages we shall look at the DOS facilities
in greater detail.

We shall look at the meanings of some of the terminologies
used in this connection first.

3.1   TERMINOLOGY

DISK DRIVE: The micro computers can have one or more
magnetic disk units or drives attached to it. Generally
they have one or more "Floppy" or "diskette" drives of small
capacity and perhaps a "Hard disk" drive of relatively
larger capacity.

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FLOPPY/DISKETTE DRIVE: These drives are used to read/write information from/to the floppy or diskettes. The diskettes are removable, flexible magnetic disks enclosed in a paper envelope with openings on either side for the machine to access the data written on the surface of the disk inside. They hold the data on circular tracks on their surfaces. Their capacities normally range fron 360 KB to IMB. If the micro computer has 2 diskette drives on it, they are normally referred to as drives "a:" and "b:".

HARD DISK: The 'Hard disk' as the name suggests is a fixed disk inside the micro. This normally has a higher storage Capacity of 10_100 MB. This drive is normally referred to as drive "C:".

BYTE: A 'Byte' as we saw earlier is a single character represented by 8 binary digits (BITS) in a suitable Code such as "ASCII" or "EBCDIC".

FIELDS: "Fields" of data are single units of information stored on the computer. Examples are ISBN, AUTHOR, STOCK NO. etc.

Fields can be of different sizes or length. Example ISBN = 10 Bytes in length.

RECORDS: a 'record' is a collection of a number of units or

'fields' of data pertaining to a single object. For example a 'book'record can have different 'fields' or data items associated with it such as 'Author', Publisher', 'ISBN', 'Price' etc.

FILE: A file is a collection of many records pertaining to a single 'subject'. For example a 'Book' file can contain details of say 1000 books, if you have 1000 books in your library.

Naming Convention for Files under DOS

A File Name can be 1 to 8 characters long and can additionally have an (Optional) extension name of 3 characters. The 'File' and 'Extension' names (if present) should be separated by a period (.). The following extension names are used by DOS to indicate special type of files:
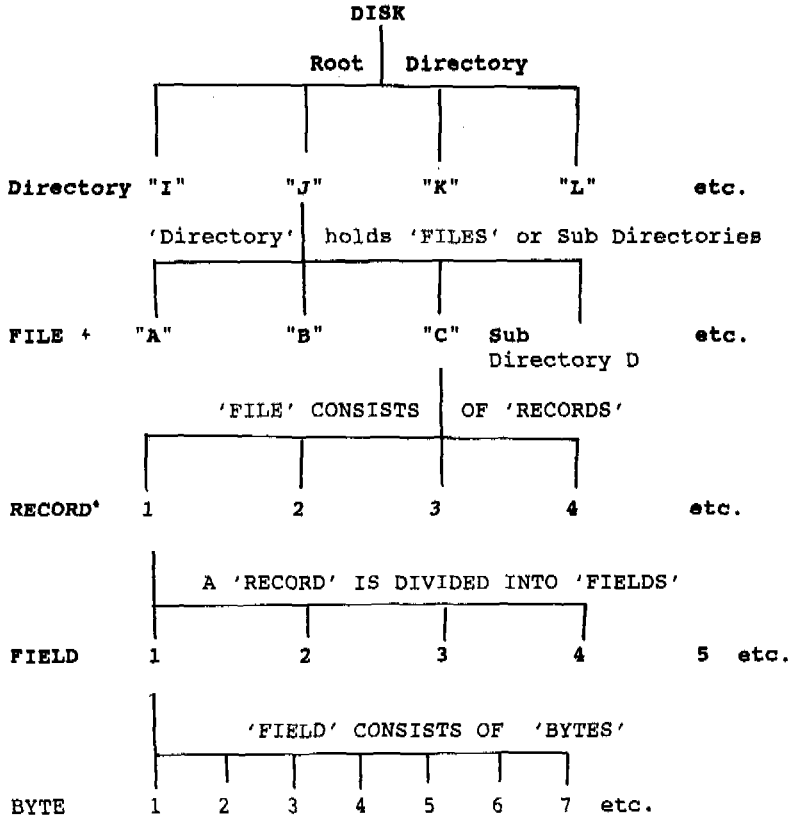
COM & EXE	-	Program Files
BAK	-	Back-up files
BAT	-	Batch (Program) files
BAS	-	BASIC Program files

A file need not have an extension name. You may use any of the valid characters in ASCII for file and extension names.

DIRECTORY: A directory is a collection of a number of files usually pertaining to one subject. A 'Directory' holding Library information can have a number of files, say, for holding information on Stock, Authors, Titles, Members etc. Directory names follow the same conventions as for files.

The above 'hierarchy' of storage of information can be
illustrated in a 'Top down tree' structure as follows:

HIERARCHY OF DATA STORAGE

```
                              DISK
                      Root |  Directory
         ┌──────────────┬──────┴────────┬──────────────┐
                                                              
Directory "I"         "J"           "K"          "L"        etc.

         'Directory'| holds 'FILES' or Sub Directories
              ┌──────────┬──────────┬──────────┐
                                                    
FILE +    "A"          "B"         "C"   Sub                etc.
                                         Directory D

              'FILE' CONSISTS | OF 'RECORDS'
              ┌──────────┬──────────┬──────────┐
                                                    
RECORD⁴   1            2           3           4          etc.

              A 'RECORD' IS DIVIDED INTO 'FIELDS'
              ┌──────────┬──────────┬──────────┐
                                                    
FIELD     1            2           3           4        5  etc.

              'FIELD' CONSISTS OF  'BYTES'
              ┌───┬───┬───┬───┬───┬───┐
                                          
BYTE      1   2   3   4   5   6   7  etc.
```

---

⁴ Please note that the structure below the 'File' level
depends on the type of File. For example in the case of a text
file such as a Word Processing Document, the file contains a
document divided into paragraphs, sentences, words etc.

PATH:

A path shows the route that leads to the file stored in a
directory/sub directory. For example in our above
illustration the route to FILE "C" (Disk in drive A:) is:

Drive A: Directory "J" FILE "C" written as:

A:\J\C

Note that the device name A is followed by the colon (:) and
a 'backslash' seperates the file name and Directory name.

FILE EXTENSIONS:

The "FILE" name can be suffixed by an extension name in 3
characters. For example all 'command' files have the
extention "COM"   Eg. CHKDSK.COM

Note that an extension name is seperated by a period (.)
from file name.

DEVICE NAME: DOS uses a single character 'Device name' to
refer to the disk drive as explained earlier. The device
name is followed by a 'Colon' (:) in DOS Commands. Eg.

a: Device name for the 1st floppy disk drive
b: Device name for the 2nd floppy disk drive
c: Device name for the Hard Disk

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Thus a file called 'MYFILE' in a directory called 'DIRA'
stored on the Hard Disk will be referred to by a path name:

C:\DIRA\MYFILE

If this file has an extension name "TST" for example, the
path name would now be:

C:\DIRA\MYFILE.TST

Device   Directory   File   Extension

3.2 LOADING & USING DOS

The DOS programs come in the DOS 'System Diskette' supplied
along with the Computer and can be 'Loaded' from either this
System Diskette or from the Hard Disk of the Computer if
it has been transferred to the Hard Disk. If the DOS is to
be loaded from the DOS Diskette, this diskette has to be
inside the diskette drive a: while the power is switched on
in order for the Computer to 'Boot' or load the DOS into
it's internal memory.

As we saw earlier, the Disk Operating System is the set of
Programs which has the responsibility of supervising and
controlling the overall operations of the Computer System
(The IBM PC or Compatible). In order to do this, the
Computer 'Loads' only a part of the DOS suite of Programs,
called the 'Internal Commands' initially into it's memory
when the power is switched on.

The 'Internal Commands', also called the 'Command
Processor', is the most important part of DOS and is in fact
a Program in the DOS Suite with the name 'COMMAND.COM'. This
program once loaded into the Computer memory 'takes charge'
of the Computer so to speak, interprets the DOS commands as
they are entered by the the Computer User and calls and
loads other programs in the DOS suite for carrying out
other DOS functions, as may be necessary. Incidently, the
reason only the Command Processor and not the whole DOS
suite of programs is loaded is because the Command Processor
occupies only about 25 Kbytes of memory depending on the DOS

version while the whole DOS can occupy over 300 Kbytes. It would therefore be a waste of the limitted Internal Memory available, or sometimes even impossible if the available memory is too small, to keep the entire DOS programs in the RAM.

The process of 'Booting' is automatic once the power is switched on and when the DOS is loaded, the System may prompt you to enter the date and time of the day depending on whether it has a built in 'powered clock' or not. Then the System displays the DOS 'Prompt'as follows:

A:>   - if 'Booted' from drive A:

C:>   - if 'Booted' from the hard disk C:

The prompt says that the system is ready to accept a DOS Command. You can now type any DOS Command next to the DOS Prompt and press the 'Enter Key'. The Command Processor will then interpret this command and carry it out.

Some Commands are built into the Command processor and these are called 'Internal' Commands. An example is the DIR Command. If you had typed one of these, the Command processor can execute it without loading the relevent processing program from the DOS disk/diskette. On the other hand, certain other commands such as the FORMAT command, which are called 'External Commands' require the relevent program to be loaded from the DOS Disk/diskette. The reason as you will recall, is that the system does not load the

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entire DOS when 'Booting' and keeps the major part of the DOS programs outside the Internal Memory, on the External Storage Device (The DOS disk/Diskette).

We shall now look at the major DOS Commands and their functions in the following pages.

3.3 "DOS" COMMANDS:

'Commands' are the means of Commmunication between a user and the micro computer Operating System. In fact this is true of all modern Computer Systems. The Disk Operating System (DOS) has a large number of Commands using which the user sitting in front of the keyboard can make the computer do useful work for him. These commands, for example, are used to prepare disk for data storage, manage files stored on them etc.

We shall now see the most important of these commands and briefly discuss them one by one later.[5]

SOME IMPORTANT DOS COMMANDS

Command   Function

1. CHDIR (or CD)   Change Directory

2. CLS   Clear screen

3. COMP   Compare files

---

[5] In discussing the DOS Commands, only the basic form of the command is used. Many DOS commands have a number of parameters associted with them to provide additional information or directives on how the Command should be executed. These are optional and since the scope of this course is introductory, these options are not discussed here. For a full discussion of each command, the student is directed to refer to the DOS manual.

4. COPY   Copy files

5. DEL (or ERASE)   Delete files

6. DIR   Display Directory

7. DISKCOPY   Copy Diskette

8. FORMAT   Format Diskette/DISK

9. MKDIR (or MD)   Make Directory

10. PATH   Set Path

11. RMDIR (or RD)   Remove Directory

12. EDLIN   Line Editor

The above commands are briefly discussed below:[6]

1. CHANGE DIRECTORY   CHDIR (or CD)

This command changes the current directory of the
specified drive to the new one. This allows you to
refer to files in this directory in the absence of a

---

[6] Please note that while typing DOS Commands, you may use
either the upper case or lower case characters. Thus the Command
DIR A: can also be typed as: dir a:

'Path' command.   (See 'Path' Command for more details).

Eg:_   CD C:\DIRA

(DIRA in drive C is made the current directory).

2.   CLEAR SCREEN _ CLS

This command clears the screen of all displays.

3.   COMPARE FILES _ COMP

Compares the Contents of the (first set of) file(s) with
that of the second (set of) file(s).

Eg.   COMP   a:\MYDIR\FILEA   b:\YRDIR\FILEB

(Compares the Contents of   FILEA in MYDIR on drive A)
               with that of   FILEB in YRDIR on drive B)

If they are not identical, (i.e, the Contents are not
identically equal) a message is displayed to this
effect.

4. COPY FILES __ COPY

(1) Copies files from one diskette/disk to another with

the same names.

(2) Also can copy files with a different output names.

Eg: Copy A:\MYDIR\FILEA B:\DIRB\ (case 1)
     Copy A:\MYDIR\FILEA A:\MYDIR\FILEB (case 2)

5. DELETE FILE __ DEL (OR ERASE)

Deletes the specified file.

Eg: DEL   a:\MYDIR\FILEB
or   ERASE a:\MYDIR\FILEB

6. DIRECTORY DISPLAY __ DIR

Displays directory information.

Eg: 1) DIR C:\MYDIR (Displays the details of the file
                       and sub_directories in the
                       directory MYDIR in drive C:)

     2) DIR A: (Displays all directories and
                       files in drive A:)

     3) DIR   (Displays details of the current
                       diretory)

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7. COPY DISKETTE   DISKCOPY:

Copies the Contents of one diskette to another (and
optionally formats the diskette while copying if not
already formatted).

Eg: DISKCOPY a: b:

8. FORMAT DISK   FORMAT

The format command prepares the disk for use by DOS to
store files. The surface is analysed for any faulty
areas and this information is stored.

Eg: FORMAT a:
     (formats the diskette in drive a:)

9. MAKE DIRECTORY   MKDIR (or MD)

This creates a directory on the disk.

Eg: MD A:\MYDIR
     (creates a directory by name 'MYDIR' on drive a:)

MKDIR C:\DIRA\DIRAB

(creates a sub_directory called 'DIRAB' in 'DIRA' in drive c:)

10. **SET PATH _ PATH:**

This command sets a path for Searching for command or Batch files that are not in the current directory.

Eg: PATH c: MYDIR; DIRA; DIRB
     (The search route for Command or Batch files is
     set to   1st _ MYDIR
               2nd _ DIRA
               3rd _ DIRB

If a Command File is not found in the current directory, the system will now look for it in 'MYDIR', 'DIRA' and 'DIRB' in that sequence).

11. **REMOVE DIRECTORY _ RMDIR (or RD)**

Removes a directory from the disk specified.

Eg: RD a: MYDIR
(Removes the directory 'MYDIR' from drive a: However
the directory should be empty before it can be
removed).

12. THE LINE EDITOR : EDLIN

The Line Editor (EDLIN) is actually a program with its own minor commands. This program can be used to:

(a) create files of data

(b) update (edit) files thus created.

The editor program is loaded by the command 'EDLIN'. Once loaded,the EDLIN prompt '*' is displayed on the screen. Further actions are performed according to the EDLIN Commands input subsequently, next to the * prompt.

Eg: EDLIN   C: BATCH\PROG1

(This activates the editor programs and loads the file 'PROG1' in directory 'BATCH' on drive c: for editing).

If the file specified does not exist, it is assumed to be a new file to be created.

Some of the 'Edlin' minor Commands are listed below:

    I   for Insert lines
    D   to Delete lines
    A   to append lines at end of file

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```
C  to  Copy   lines
L  to  list   lines
M  to  move   lines
E  to  end    edit and save the file.
```

Eg: ***4,8D   to delete lines 4 to 8**
*9I   to insert a new line before the 9 th line
*1,10L to list lines 1 to 10

etc.

If you wish to edit an existing line you only need to type the line number to be edited.

Eg: *6 to edit line number 6

3.4   DOS PROGRAM FILES (<u>BATCH FILES</u>):

Instead of entering the DOS Commands using the keyboard
each time, you can also create a file containing sequences
of DOS Commands frequently use, called a 'Batch file'. By
running this 'Batch Program', you can save the trouble
of keying commands the hard way every time you want to run
such DOS Command sequences.

The EDLIN described earlier, can be used to create and save
such 'Batch file'.

A 'Batch file' must have the filename extension '.BAT'.
(Please note however that creating Batch files will be
useful only if you intend to use such DOS Command sequences
frequently).

Eg: The following DOS Commands can be entered into a Batch
      file name DB.BAT.

      Line 1 CD\DBASE   (changes current directory to DBASE).
       "   2 DBASE   (runs DBASE 3 program).
       "   3 CD\   (changes current Directory back to
                         root directory).

This Batch program can be run by simply typing "DB" if it is
in the current directory or in the Path set.

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REVIEW QUESTIONS:

1. What do you understand by the term 'DOS'?

2. What is a directory? Explain the hierarchy of data storage on disk under the 'Disk Operating System'.

3. Distinguish between 'Internal' and 'External' Commands.

4. Explain the functions of the following DOS Commands:

   DIR
   COPY
   DISKCOPY
   FORMAT
   MKDIR

5. What is a 'Batch' file? How are Batch files useful?

4.   DATA BASE SOFTWARE: DBASE 3

The DOS (DISK OPERATING SYSTEM) is an 'operating system' software as we have seen earlier, with facilities for DISK management and other file creation and editing facilities. But is is not a 'Data Base' software. What this means is that it would be difficult, at least for the non_expert, to use the DOS alone to create a program to enter, retreive and manipulate data items to serve complex information processing needs.

The DBASE 3 was developed by Ashton_Tate of U.S.A. and has now become one of the most popular micro_computer Based 'Data Base Software' Packages.

It is a 'Relational' Data Base software in a limitted form. In the 'Relational' technique, data is stored in an 'array' or 'table' form made up of rows and columns, the columns representing the 'data items making up the individual field of the record and the 'rows' representing the individual records themselves.

As we saw earlier, a 'Data Base Software' should have facilities to define 'Data structure', accept and store these data items and be able to manipulate and retrieve them as needed as well as prepare useful reports based on the stored data. We will now see how DBASE3[7] does these things.

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[7] The concepts and commands discussed here, though specific to the dBase3, also applies to later versions of this software such as dBase3+ and dBase4. The discussion here was limitted to dBase3 due to its poularity and wide installed base.

4.1 **DBASE 3 HIGHLIGHTS:**

1. Using DBASE 3 you can create 'Data Base structures' of
    records upto 4000 Bytes (characters) long, having a
    maximum of 128 fields per Record.

2. The software creates a default screen for Data Entry
    based on the structure thus created or you can create
    your own "custom made" screems for this purpose.

3. A maximum of 1 billion records can be accommodated in a
    file, though this maximum is dependant on the disk space
    availability.

4. Files can be 'Indexed' on multiple fields.

5. Various DBASE 3 Commands can manipulate this data base
    or retrieve information from it. DBASE 3 programs can
    be written using these Commands.

6. The 'report' facility can be used to prepare quick
    reports.

4.2   LOADING dBASE3

In order to make use of the dBase3, you have to 'Load' it
first into the Computer Memory (RAM), as in the case of any
other Program. You can 'Load' dBase3 either from the
diskettes or from the hard disk.

To load from the diskettes, insert the dBase3 system
diskette into the drive a: and change the DOS prompt to show
drive a: if it does not already do so by typing a: and
pressing the 'Return' key.

Then type: 'dbase' (without the qoutes) and press return.
This will load the dbase program from diskette in drive a:

To load from the hard disk, first change into the Directory
where the dBase3 programs are stored. Then type 'dbase' to
load dbase3 as in the case of loading from diskettes. If for
example the dbase directory is called DBASE the steps for
loading will be as follows:

        CD DBASE   - to change directory to DBASE
        dbase   - to load the dbase

Once the dBase3 is loaded the screen displays the dBase
Promt which is a dot (.). This prompt which is sometimes
called the DOT Prompt tells you that the Computer is ready
to accept any dBase Command. (Remember the DOS Prompt?).

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You can also get 'On-Line' help to overcome difficulties
that you may experiene especially in the beginning, by
pressing the Function Key F1.

For the beginner, the ASSIST mode provides a menu driven
environment to enter the commands. Here you can choose from
the menu options without having to remember the commands and
their various options. To enter the ASSIST mode you type the
command ASSIST from the dBase3 dot prompt.

4.3 SOME dBASE3 CONCEPTS

Data Base Structure

As we saw earlier, dBase3 is used to Capture and then
Process data in various ways. Data is first Captured or
Entered into Data Base files. A Data Base file has a
'Structure' which has to be defined first before data can be
captured into it. This defines the structure of the Data
Records by defining the Fields (Refer to the section on DOS
Terminology). The structure of a DataBase is created using
the 'CREATE' Command. The File-Name parameter associated
with this command specifies the name of the Data Base.

(For details refer to the Commands section)

Using a Data Base

Once a structure is defined for a data base, you can use
this Data Base to 'Append' or enter data records into it.
You can also EDIT or modify the data already captured, LIST
the records or BROWSE them. You can modify the Structure of
the Data Base using the 'MODIFY STRUCTURTE' command without
losing the existing data records or copy the structure to
another data base. You can replace fields of data
selectively or delete entire records.

Creating Reports

dBase3 has also has a report creation facility with which

you can generate reports based on your database files. This facility is invoked by the Command CREATE REPORT. The Report Structure (called the REPORT FORM) once created can be later modified using the MODIFY REPORT command.

Index Files

Index files are special files which can be created and used to process data records in a database file in a specified sequence. For example, if you have a data base called BOOK which need to be processed to print reports in the order of 'Accession Number' in one case and alphabetically by 'Title' in another case, you can have two index files created for the BOOK data base.   If the first index file is called ACCESS and the second one TITLE, then you can use the BOOK data base in conjunction with the index file ACCESS for the first report and in conjunction with the TITLE database for the second report (See the INDEX Command in the Commands section for more details).

Alternately, you have also the facility to 'Sort' the database records into the desired order and then use the sorted file (See SORT Command).

4.4 **DBASE 3 COMMANDS**

Like the 'DOS', DBASE 3 has its own commands using which one
can carry out various data processing functions. We shall
now see some of these commands and their functions in brief
form.[8]

1. **APPEND:**

The 'Append' Command adds records at the end of the
active Data Base, placing the user in 'full screen' Data
Entry mode.

2. **ASSIST:**

The assist Command puts the user in a full screen 'menu
driven' mode rather than the usual 'Command' mode, so
that the less experienced user may easily select
command functions from the 'menu'.

3. **BROWSE:**

'Browse' Command allows the user to look or 'Browse'

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[8] It should be noted that most of these commands as in the
case of DOS, have further optional parameters associated with
them. For a full discussion of these commands and their
parameters, the student should refer to the dBase3 manual.

through the contents of the Data Base, while making
changes to them.

4. <u>COPY</u>:

The 'Copy' Command is used to copy the 'active'
Data Base file to a new data base file.

Eg: If the active Data Base file is called 'LIBRARY', to
create a new data base called 'LIBR1' with the same
structure, the commands will be:

.**USE LIBRARY**
.**COPY TO LIBR1**

5. <u>COPY FILE</u>:

This command creates a copy of any file. (not
necessarily a data base file).

Eg: .**Copy File filename1 to filename2**

The file specified by 'filename1' is copied to
'filename2'. The filename should include the filename
extension also if present.

6. CREATE:

This command creates a 'Data Base Structure' for a new
Data Base File.

Eg: **.CREATE filename**

The file thus created will have the extension .dbf
which defines it to be a Data Base File.

The 'create' Command brings up the next screen through
which you can specify the Data base fields. The various
items of information relating to a field which should be
specified are:

(1) Field name

(2) Field Type (whether character, numeric, Date or
     memo).

(3) Field width (The length of the field in bytes).

(4) Decimal Places (if Type = Numeric).

7. CREATE REPORT:

The 'Create Report' Command is used to create a file of
report specifications based on the Data Base in USE.
This command brings up other menu screens to specify the
report parameters. Once the specifications are over,

the file thus created can be used to run the report
using the 'REPORT' Command.

Eg: .CREATE REPORT filename.

8. **DELETE**

The 'delete' Command marks records in the active
data base for deletion.

Eg: .DELETE RECORD 10

(this marks the 10th record for Deletion).

The actual deletion of the record (Removed from
database) takes place only when a 'pack' command is
issued (see 'Pack' Command).

The records marked for deletion appears with a '*' in
the 1st position of the record.

9. **DISPLAY STRUCTURE**

This command displays the structure of the Data Base in
use.

Eg: .USE LIBARY
    .DISPLAY STRUCTURE

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10. **EDIT**

The 'Edit' Command can be used to edit the contents of an entire record in the data base which is active. The record number to be edited can be specified.

Eg: .EDIT RECORD 10

11. **ERASE**

The 'Erase' Command can be used to delete a file from the directory.

Eg: .ERASE b:LIBR1

12. **FIND**

The 'Find' Command is used to locate a record in an indexed Data Base.

Eg: .FIND 5 to find the 5th record .

13. **INDEX**

The Index command can be used to create index files for databases. These index files can be later used to process the records from such data bases in specified sequences.

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For example assume that we have a data base called BOOK. We wish to process this data base file in 2   sequences   as follows:

> 1. In the order of Accession Number (Field name ACCNO) say, to print a report in accession number sequence.

> 2. Alphabetically by Title (Field name TITLE) to print a report in title sequence.

In this case we would first need to create 2 index files say, called ACCESS and TITLE[9] for the above 2 sequences. This is achieved by the following commands (Assuming the data base file BOOK is already created)

> **.USE BOOK**
> **.INDEX ON ACCNO TO ACCESS** – This crates the ACCESS
> index file.
> **.INDEX ON TITLE TO TITLE** – This creates the TITLE
> index file.

Once these index files are created they can be used as follows:

> **.USE BOOK INDEX ACCESS**   –   To process the file
> in the order of
> Accession Number (By
> subsequent Commands)

---

[9] The INDEX files are created with an extension name of NDX by the System. This identifies them as index files. Therefore an index file called TITLE is stored under the file name TITLE.NDX.

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```
          .USE BOOK INDEX TITLE      -   To process the file
                                         in Title Order.
```

14. MODIFY STRUCTURE:

This Command is used to modify the structure of an
existing Data Base.

Eg: MODIFY STRUCTURE   filename.

This brings up the screens, like in 'CREATE' to add
fields or change fields.

15. MODIFY REPORT

Like in 'modify structure', this Command can be used to
modify the report specifications of an existing 'Report
File'.

Eg: MODIFY REPORT   filename.

16. PACK:

This Command 'removes' all records marked for deletion
from the active data base.

17. QUIT:

This Command closes all active data base files and ends
the 'dbase 3' session, returning control to 'DOS'.

18. **REPLACE:**

The 'Replace' Command is used to change the contents of
the active data base, specifying the Conditions for
replacement.

(See the example under 'Operators')

19. **REPORT:**

The 'Report' Command Prints information from the active
data base as per the report form specifications (see
'Create Report' Command).

    Eg: .USE BOOK
        .REPORT FORM report-form name (TO PRINT)

20. **SORT**

The SORT command sorts the records from the active data
base into a new data base of the same structure on
specified fields in ascending or descending order.

    Eg: . USE BOOK
        . SORT TO NEWBOOK ON ACCNO

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This sorts the records in the active database BOOK on
the field ACCNO in ascendind order (by default) and
creates a new database called NEWBOOK which will now
contain the sorted records.

21. **USE:**

This Command opens an existing data base file and
optionally any index files (upto 7 numbers), for
processing.

Eg: .USE BOOK

Specifies that the Database called 'BOOK' should be
used. In other words, BOOK becomes the active DataBase.

4.5 **OPERATORS**

Dbase3 has provisions to accept mathematical and logical operators in their Commands.

(a) **MATHEMATICAL OPERATORS**

These are +, _, *, /, ** and ()
Their meanings are as follows:_

+   _   **Addition**
_   _   **Subtraction**

*   _   **Multiplication**
/   _   **Division**
**   _   **Exponentiation**
()   _   **Grouping (Parenthesis)**

Eg: .USE FILE1
      .REPLACE ALL   FIELD1   WITH
                (FIELD2 + FIELD3)/(FIELD4_FIELD5)

Here the field named FIELD1 in the active data base 'FILE1' is replaced by the result of the operation:

$$(FIELD2 + FIELD3) / (FIELD4 \_ FIELD5)$$

(b) RELATIONAL AND LOGICAL OPERATORS

```
<      _     less than
>      _     greater than
=      _     equal to
<>     _     not equal
<=     _     less than or equal
>=     _     greater than or equal
.AND.  _     Logical and
.OR.   _        "      OR
.NOT.  _        "      NOT
```

Eg: REPLACE ALL FIELD3 WITH (FIELD1 * 5) FOR FIELD1 <> 0

If the value of the field1 is not equal to '0', then field 3 is replaced by the product of field1 multiplied by 5.

4.6 **COMMAND FILES**

Like the 'DOS' Batch file where you can store frequently
used DOS commands for repetitive use, you can create DBASE3
Command files to run repetitive DBASE3 Command sequences,
called a DBASE3 'program'.

The 'Command' files have an extension name of '.PRG'.

The command files can be created using DBASE3 editor. The
editor is invoked by the command 'MODIFY COMMAND'.

Eg: .MODIFY COMMAND   filename.

Such a Command file can be later executed by typing the
Command:

                    DO 'filename'
Where 'filename' is the Command file name.

This facility can be used to create very useful DBASE3
programs.

Alternately you can also use any Word Processing Program in
order to enter and create a command file.
In this case it should be born in mind that Word Processing
Programs add their control characters to control various
aspects such as printer options, along with the text
normally and the text mode should be used to avoid
this.

REVIEW QUESTIONS:

1. What do you understand by the term 'Database' Software?

2. Your Organisation wants to enter the Bibliographic data of your Library into a Computer using dBase3 . Explain the steps you would take to do this.

3. Explain the functions of the following dBase3 Commands:

   APPEND
   COPY
   CREATE
   INDEX
   MODIFY STRUCTURE

4. What are 'Operators' in dBase3 Commands?

5. What is a 'Command' File? How are Command files helpful?

V.   PROJECT WORK USING DBASE 3 ON THE MICRO

V.1 The normal functions of a library such as Aquisitions,
     cataloguing, circulation control, serials control etc.
     involve routine accessing, retrieval and updating of large
     amounts of data. By their very nature, these tasks are
     ideally suited for computerisation.

     A full Library System on the Computer has to be very
     comprehensive and will include facilities for carrying out
     the above functions in addition to others such as
     preparation of management reports. Programming for such a
     system can take many man_years and consequently ready_made
     software Packages are often used for such work, instead of
     each library developing a system for itself. However it is
     also possible to develop a useful system for small libraries
     which can run on a micro computer, using Data Base Packages,
     without much effort. These obviously may have their scope
     considerably reduced, but can still be very useful and
     adequate for such organisations.

V.2 **Preparations for the Computerisation of a Small Library.**

     In deciding to computerise a Library (small or big) you have
     to take decisions on the following points.

     (1) Deciding on the scope and extend of Computerisation.

(2) Determining the type and struture of Data Base files necessary for the system.

(3) Determining the Processing steps and reports to be printed and their contents.

(4) Programming for the above.

(5) Testing and debugging the programs.

(6) Implementing the system.

In this course we will consider the computerisation of one aspect of a Library's work, viz, circulation functions, in a simplified form and limitting ourselves to the following 3 typical functions coming under this category.

(1) Borrower (Member) registration.

(2) Item maintenance.

(3) Processing Issues/returns.

We shall look at them in greater detail now.

Borrower Registration: This involves entering all necessary details of the Borrower into the Computer. This step will create a file of 'Borrowers' who are authorized to borrow books from the Library. Typically the following details may be captured:

> Borrower number
> Surname
> First name
> Date of expiry of membership
> Address
> Phone number

Item Maintenance: Details of all items in the library such as Books and Periodicals have to be entered into the Computer to create an Item File. Typical details can be:

> ISBN/ISSN
> Accession No.
> Title of the item
> Author
> Publisher etc.

Data Base Files Structure

The Data Base file structures for the above 2 files are given in appendix _ C1 and C2.

You will notice that we have included details of borrowings (upto 2) in the Borrowing File. This is because we shall

make an assumption that each borrower can only borrow upto 2
items. You can also design the system to have separate
Borrowings File especially if a member is allowed to borrow
a number of items.

The status field in the Item File indicates the status of
the item _ whether on shelf (S) or on Loan (L).

V.3 PROCESSING STEPS

We will consider the following processing steps which
constitute our sub_system.

1. Capturing Borrower details

2. Capturing Item details

3. Issue Processing

4. Return Processing

5. Printing overdue_report

These are discussed briefly below:_

(1) **Capturing Borrower Details:** This involves the initial
data capture of all existing borrowers (members) of the
Library as well as new members enrolled from time to
time.   The DBase 3 program for this is listed in
Appendix B_2.

(2) **Capturing Item Details:** As in the case of borrowers,
the details of all existing items in the Library as
well as new items received from time to time are ca
ptured.   Program listed in Appendix B_3.

(3) Issue Processing: When an item is issued to a
borrower, the issue details are entered into the
Computer which updates the Item File and Borrower File_
Program in Appendix B_4.

(4) Return Processing: When an item that has been borrowed
is returned to the Library, the details are captured
and once again the Item file and the Borrower File gets
updated with this information _ Program in Appendix B_5

(5) *Overdue Processing*: Details of all items which are
overdue are printed for necessary action _ Program in
Appendix B_6. The Report facility of DBase 3 is used
to print the report. The program merely calls the
Report Form created for this purpose.

The system flow charts for these processing steps are given
in Appendices A1 to A3.

The above processing steps can be carried out by running the
relevant program under DBASE 3 using the "DO" statement.
However it will be convenient if you first run a program to
display a "menu" of the processing steps from which the
program to be run can be selected in an easier way. The
DBase 3 in fact has facilities for preparing such a program.
A "menu" program for our sub-system functions is given in
Appendix - B_1.

The Programs listed in the appendices uses commands, some of
which are not discussed in the preceding section. Examples

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are SELECT, LOCATE, IF ELSE and STORE commands. These are
however discussed along with the Programs in the class room
situation. The student is also referred to the relevent
books and manuals for a full discussion of these as well as
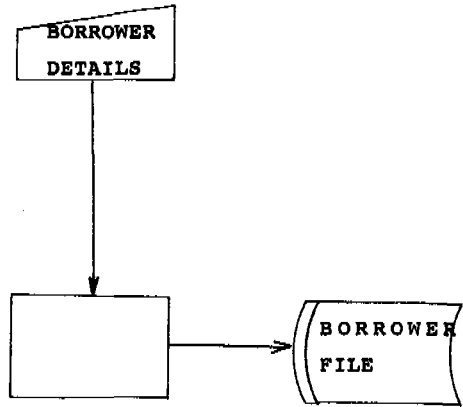other dBase3 commands.

V.3   CONCLUSION:

The system described above and the DBASE 3 programs to carry
out the processing steps are not comprehensive, but is
rather intended to illustrate how a useful system can be
developed without much effort for the computerisation of a
small Library's functions, using a data base Package such
as DBASE 3.   To make the system complete you would need
additional programming, for example to change existing
Borrower and Item details or delete them.   However it is
hoped that with the material covered, the student has
received a fair idea of the procedures and processes
involved in such a work.

The books and manuals given under the reference list should
prove to be very useful for the serious user in attempting
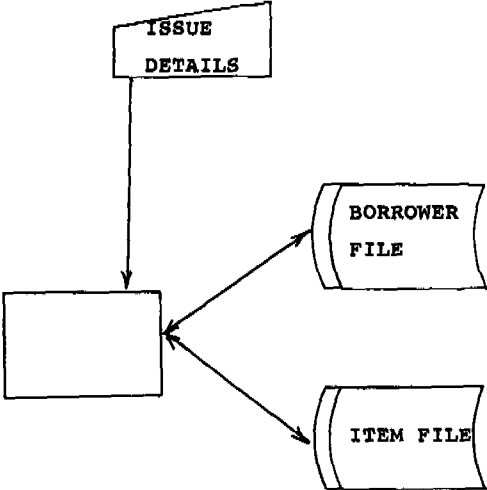to develop his own system.

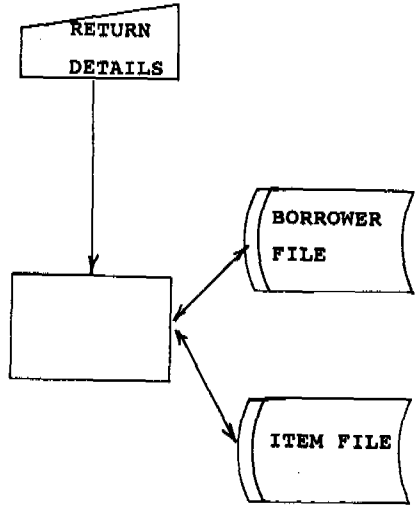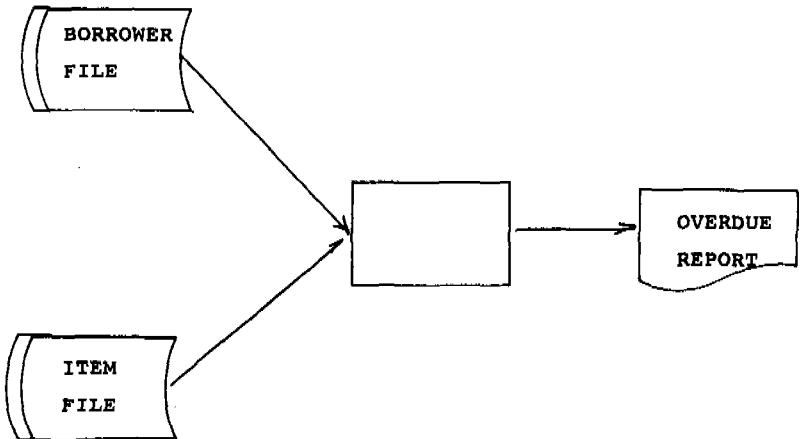# SYSTEM FLOW-CHARTS

1. CAPTURING BORROWER DETAILS

```
     ┌──────────────┐
     │ BORROWER     │
     │ DETAILS      │
     └──────────────┘
            │
            │
            ▼
┌─────────────────┐        ╭──────────────╮
│                 │───────▶│ BORROWER     │
│                 │        │ FILE         │
└─────────────────┘        ╰──────────────╯
```

2. CAPTURING ITEM DETAILS

3. ISSUE PROCESSING

4. RETURN PROCESSING

```
        ┌──────────────┐
        │ RETURN       │
        │ DETAILS      │
        └──────────────┘
               │
               │
               ▼
        ┌──────────────┐        ╭─────────────╮
        │              │───────▶│ BORROWER    │
        │              │◀───────│ FILE        │
        │              │        ╰─────────────╯
        │              │
        │              │        ╭─────────────╮
        └──────────────┘───────▶│ ITEM FILE   │
                        ◀────────╰─────────────╯
```

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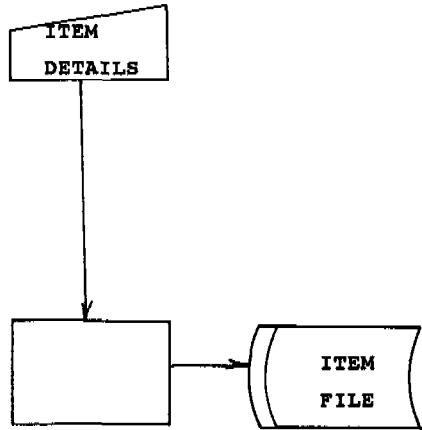
5. OVERDUE REPORT PROCESSING

LISTING OF MENU PROGRAM 'LIBMENU'

```
* Program: LIBMENU.PRG
* This is the main menu Program for the Library System
* ------------------------------------------------------
set talk off
store " " to mchoice
do while mchoice # "X"
     clear
          text
                         LIBRARY SYSTEM
                         **************
                         MAIN MENU
                         ---------


                 Select an option from below:
                 ------------------------------


                 Enter Book Details: ........... A
                 Enter Member Details: ......... B
                 Enter Issue Details: .......... C
                 Enter Return Details: ......... D
                 Print 'Due-List': ............. E
                 EXIT: ......................... X
                 --------------------------------
          endtext
```

```
@ 20,20 say "Enter Choice ..." get mchoice picture "!"
read
     do case
          case mchoice= "A"
               do bookdata
          case mchoice= "B"
               do membdata
          case mchoice= "C"
               do issue
          case mchoice= "D"
               do return
          case mchoice= "E"
               do duelist
     endcase
enddo
return
```

LISTING OF PROGRAM FOR ENTERING MEMBER DATA

```
* Program: MEMBDATA.PRG
* This Program is for Entering Member Details
* ---------------------------------------------
set talk off
use membfile
store 'Y' to cont
do while cont= 'Y'
  append blank
  clear
  @  2,0 say '              MEMBER DATA ENTRY SCREEN'
  @  3,0 say '-----------------------------------------------'
  @  5,0 say 'Member Number        ' get membno
  @  7,0 say 'Name                 ' get name
  @  9,0 say 'Address              ' get addr
  @ 11,0 say '=========================================='
  @ 15,10 say 'Continue?..... '
  @ 15,30 get cont
  read
enddo
return
```

LISTING OF PROGRAM FOR ENTERING ITEM DETAILS

```
* Program: BOOKDATA.PRG
* This Program is for Entering Item Details
* ------------------------------------------
set talk off
use bookfile
store 'Y' to cont
do while cont= 'Y'
  append blank
  clear
  @  2,0 say '              BOOK DATA ENTRY SCREEN'
  @  3,0 say '--------------------------------------------'
  @  5,0 say 'Accession Number ..  ' get accno
  @  7,0 say 'ISBN             ..  ' get isbn
  @  9,0 say 'Title            ..  ' get title
  @ 11,0 say 'Author           ..  ' get auth
  @ 12,0 say 'Publisher        ..  ' get publ
  @ 13,0 say 'Date of Accession..  ' get accdate
  @ 15,0 say '=========================================='
  @ 20,10 say ' Continue?....  '
  @ 20,30 get cont
  read
enddo
return
```

LISTING OF PROGRAM FOR ENTERING ISSUE DETAILS

```
* Program: ISS.PRG
* This Program displays a screen for entering issue-details
* and updates the membfile and bookfile with these details
* ------------------------------------------------------------
select 1
use membfile
select 2
use issfile
select 3
use bookfile
set talk off
select 2
store 'Y' to cont
do while cont= 'Y'
  append blank
  clear
  @  5,15 say 'BOOK ISSUE SCREEN'
  @  6,15 say '-------------------'
  @  8,15 say 'Member Number    ..  ' get membno
  @ 10,10 say 'Acession Number  ..  ' get accno
  @ 12,10 say '====================='
  @ 15,10 say 'Continue? ... '
  @ 15,30 get cont
  read
```

```
store '0' to flag
store membno to w1
store accno to w2
select 1
locate for membno = w1
If accno1 = '    '
    replace accno1 with w2, dt1 with date()
    else
        if accno2 = '    '
        replace accno2 with w2, dt2 with date()
    else if ( accno1 <> '    ' .AND. accno2 <> '    ')
    @ 20,0 say 'Member has 2 outstanding books'
    @ 21,0 say '    ...... Issue not done!'
    store '1' to flag
    wait
    endif
  endif
endif
select 3
if flag <> '1'
locate for accno = w2
replace st with 'L'
replace issuedto with w1
replace duedate with date()+14
endif
select 2
enddo
close databases
return
```

LISTING OF PROGRAM FOR ENTERING RETURN DETAILS

```
* Program: RET.PRG
* This Program displays a screen for entering Return-details
* and updates the membfile and bookfile with these details
* ------------------------------------------------------------
select 1
use membfile
select 2
use retfile
select 3
use bookfile
set talk off
select 2
store 'Y' to cont
do while cont= 'Y'
  append blank
  clear
  @  5,15 say 'BOOK RETURN SCREEN'
  @  6,15 say '------------------'
  @  8,10 say 'Acession Number  .. ' get accno
  @ 12,10 say '===================='
  @ 15,10 say 'Continue? ... '
  @ 15,30 get cont
  read
```

```
   store '0' to flag
     store accno to w2
     select 3
     locate for accno = w2
     store issuedto to wl
   select 1
   locate for membno = wl
   If accnol = w2
      replace accnol with space (4)
   else
      if accno2 = w2
      replace accno2 with space(4)
   else
       if (accnol <> w2 .AND. accno2 <> w2 )
       @ 20,0 say 'Member has no outstanding books...'
       @ 21,0 say 'Check the member number and Re-Enter !'
       store 1 to flag
       wait
       endif
     endif
endif
select 3
if flag <> '1'
locate for accno = w2
replace st with 'S'
replace issuedto with space(5)
endif
select 2
enddo
close databases
return
```

LISTING OF PROGRAM WHICH CALLS THE DUELIST REPORT FORM

```
* Program: DUELIST.PRG
* This program calls the the Report Form 'DUELIST.FRM' and
* prints the list of books due for return on the day
* ----------------------------------------------------------
set talk off
use bookfile
report form duelist for duedate = date()
        .AND. issuedto <> '        '
@ 24,10 say "============ END OF LIST ============"
close databases
wait
return
```

LISTING OF DATABASE FILE STRUCTURE FOR MEMBFILE.DBF

Structure for database: c:membfile.dbf
Number of data records: 0
Date of last update   : 11/25/89

Field	Field name	Type	Width	Dec
1	MEMBNO	Character	5	
2	NAME	Character	25	
3	ADDR	Character	25	
4	DT1	Date	8	
5	ACCNO1	Character	4	
6	OD1	Logical	1	
7	DT2	Date	8	
8	ACCNO2	Character	4	
9	OD2	Logical	1	

```
**  Total  **                   82
```

Explanation of fields

1. DT1   - Has the date of borrowal of the 1 st Item

2. ACCNO1   - Accession number of the 1 st item borrowed.

3. OD1   - Field indicating whether the item is
               overdue or not as follows:

               True (T)   = Overdue
               False(F)   = Not Overdue

4. DT2, ACCNO2 & OD2 repeats the above information for the
   second item borrowed (ie, if borrowed)

(Please note that an assumption has been made that a
borrower is eligible to borrow only 2 items)

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LISTING OF DATABASE FILE STRUCTURE FOR BOOKFILE.DBF

Structure for database: c:bookfile.dbf
Number of data records: 0
Date of last update   : 11/25/89

Field	Field name	Type	Width	Dec
1	ACCNO	Character	4	
2	ISBN	Character	10	
3	TITLE	Character	30	
4	AUTH	Character	20	
5	PUBL	Character	20	
6	ACCDATE	Date	8	
7	ST	Character	1	
8	ISSUEDTO	Character	5	
9	DUEDATE	Date	8	

** Total **   107

Explanation of fields:

1. ACCDATE - This gives the Date of Accession of the Item

2. ST   -   This field gives the status of the item as
                 follws:

                 On Shelf = S
                 On Loan   = L

3. ISSUEDTO -   The borrower Number to whom the item is
                 issued to.

4. DUEDATE   -   Due date of return of the item.

BIBLIOGRAPHY

(1)   IBM DOS Manual (IBM).

(2)   A Comprehensive guide to IBM PC
      (George Markowsky, Prentice Hall)

(3)   DBASE 3 Manual (Ashton Tate)

(4)   Understanding DBASE 3 and DBASE 2
      (George Burns, Sigma Press)

(5)   Advanced Teachniques in DBASE 3
      (Alan Simpson, SYBEX)

(6)   Mastering DBASE 3 +
      (Carl Town send, SYBEX)

(7)   Micro Computers for Library Decision Making
      (Eds. Hernon & McClure, Ablex)

(8)   Introduction to Library Automation
      (James Rice, Libraries Unlimitted, inc)

INTRODUCTION TO INFORMATION TECHNOLOGY: USING CDS/ISIS

K. Moahi

WHAT IS A DATABASE

A database is a collection of records, for example, catalogue cards. Together these cards makeup a card catalogue. This is a database though it is a manual one.

The records consist of fields — a field is a particular element of the object to be described. In a catalogue card, the Author, Title, Publisher, Imprint, etc are fields.

MICRO CDS/ISIS

MAIN FEATURES
1. CDS/ISIS is a database management system, but it is different from others in that it can handle fields and records of variable length. Unlike other standard database management, often referred to as structured database management systems, it has specifically been tailored to accommodate textual information and hence its suitability for library and Information centres application. Database management systems which accept variable length records are called Free Text System.

2. It works with an inverted file. The inverted file contains keywords/authors or any other field which may be used to access or retrieve records. The keywords are

linked to records by means of postings or addresses of the
documents in the file. CDS/ISIS maintains this inverted
file semi-automatically.

3. The user can create their own database. This involves the
    following:-

    a) Definition of fields, in the field definition table.
    b) Definition of data entry worksheets.
    c) Definition of access points in the field Select
        table.
    d) Definition of display/print format using the print
        Format Language.

4. The database created can therefore be added to modified.

CDS/ISIS DATABASE: CONCEPTS

MFN - Masterfile Number, each record in the file (called the
        Master File) is automatically assigned an MFN.
        records be filled.

There are two types of worksheets:-

System Worksheet

 - supplied by the system for additional information, e.g.
 when you want to print, or exchange/import data.

Data Entry

- these are used to modify/create database records. They are
   created by the user according to the users needs. The
   worksheet created during the initial database creation
   stage becomes the default data entry worksheet.

MASTER FILE

All records making up the database are stored in the master
file. However, unlike the cross reference File - an index
giving the location of each of record in the master file. The
conference file enables the retrieval directly by record
number.

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INVERTED FILE

An inverted file is also another index to the master file. however, unlike the cross-reference file which gives access to record number by record number the Inverted File can give access author, keyword out of title, that is, any field element user decides to make an entry point.

FIELD DEFINITION TABLE

It provides information on the types of fields contained in a database. It is used to first define the various fields and a number of parameters for each field. Information provided in the FDT is used to control the creation of database entry worksheets and to validate the contents of the fields during data entry. FDTS are created/modified using the program ISISDEF. Each line of the FDT contains the following:

(1) Field Tag
(2) Field Name
(3) Maximum Field Length
(4) Field type
(5) Repeatability
(6) Subfields/pattern

FIELD SELECT TABLE (FST)

- Defines how one or more elements can be extracted from a masterfile record. It is used for creating access points for the inverted file to be define how records should be sorted.
- FSTS are also created by means of the programme ISISDEF. Each line of an FST contains the following:-
   (a) A field indentifier (assigned to the element produced)
   (b) A format (used to extract the element from the record).

CDS/ISIS EDITORS

(1) FIELD EDITOR

    - used for data entry and editing. It is invoked automatically by CDS/ISIS whenever appropriate.

(2) LINE EDITOR

    - used to create or edit system tables such as FST and FDT.

    - Also invoked automatically.

(3) WORKSHEET EDITOR

    - used to create or edit data entry worksheets system worksheets. Also invoked automatically.

(4) MENU EDITOR

    - Used to create or edit menus using the ISISUTL program.
    Users may want to create their own menus or even edit the system menus.

MAIN PROGRAMMES IN CDS/ISIS

(i) System Programmes

(ii) User Programmes

(i) SYSTEM PROGRAMMES

System programmes are used in the definition of the structure of the database, ie. the definition of new databases and modification of existing ones. The program used is ISISDEF.
- Provides utility functions for the maintenance of the database. These include the following:-

    (i)   The creation and editing of the system menus and worksheets,

    (ii) Printing of menus and worksheets

    (iii) Redefinition of the screen attributes: and printing of the system error messages. The program use here is ISISUTL.

- Provide facilities for the interchange of data with other
  systems and facilities for maintaining the Masterfile. Data
  can be transferred to other to other systems. The
  masterfile can have a backup copy made, can be restored
  using the backup copy and can be reorganised. Program
  ISISXCH is used for the above.

USER PROGRAMMES
- user programmes act on already established Databases.
  Programme ISIS, is used for the following:-
(i) Data Entry.
(ii) Searching the database.
(iii) Browsing through the database.
(iv) Displaying the search results and terms
     dictionary.
- The ISISPRT programme is used to print the database
  records. Search results can also be printed. The
  programme can also be used to print indexes (subject or
  author).
- ISISINV is used to print database records - all of them or
  part of the database. Search results can also be printed.
  The programme can also be used to print the inverted
  file.

INFORMATION RETRIEVAL AND RELATED FUNCTIONS

Using the ISIS programme.
(a)   TWO DISKETTE BASED.
(i)   Insert the database diskette in drive A: and the
      programme in drive B:
(ii) Ensure you are in the A: directory: Type B:ISIS <CR>
(b)   HARD DISK
(i)   Ensure you are in the right directory by typing: CDS ISIS
      <CR>. Chose the programme ISIS by typing the letter

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appearing on the left hand side of the option required.

L - Change Dialog Language

CDS/ISIS comes in a number of different languages,
English, Spanish, French and Italian. By entering
the letter L, the user is presented with a secondary
menu XLNG giving a list of the available languages.
After selecting one of these languages, all menus,
prompts and system messages will be in that language.

C - Change Database

CDS/ISIS allows for the user to change from one
database to the other without having to leave the
programme and start again start again. Having chosen
this option, the system prompts the user to
give the name of the database required. In this case,
we use the sample database CDS.

Change to CDS (sample database) by typing: CDS

CDS/ISIS will then be doing the following:

. Check that such a database exists, and alerts you if it
does not.

. Select the default data entry worksheet, and display
format for the database (which was created when the
database was defined).

. it redisplays the menu EXGEM.

B - browse the database.

- Enables the user to look through the Masterfile. Having
chosen B, the system responds with a prompt staring to
MFN to browse. The default is *MFN* 1 (- the first
record). However, you can start at any point you wish.
CDS   does the following:-

. The records are displayed using the default display
format.

. The records are displayed a screenful at a time. The
user is allowed to look at the records before

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proceeding by pressing enter/return (<CR>).

- To stop browsing, the user must type X - which returns the user to the menu EXGEN.

S - SEARCHING THE DATABASE

Inverted File

CDS uses the inverted file/index file/dictionary associated with the database to search. The inverted file is created by the user telling the system what access points are and how they should be indexed. It consists of the following:-

(a) a serial number counting the terms.

(b) a number corresponding to the frequency of occurrence of the term in the database.

(c) The term itself.

(d) Lists of all posting linked to the term.

eg. 5 4 ADULT

-3/187   85/24/1/1

(a) 5 is the serial number counting the terms. ADULT is therefore the fifth term in the inverted file.

(b) 4 corresponds to the frequency of occurrence of the term in the database. ADULT occurs four times in the database.

(c) ADULT is the term

(d) 3/187 gives the address of the record in the database. It simply means that the record can be found in block 3 offset 187.

(e) (i)   85 is the Master File Number (MFN) of the record containing the term ADULT

   (ii)   24 is the TAG number of the field containing the term ADULT.

   (iii) 1 is the serial number of the term in the whole record. ADULT is therefore the first word in the record.

SEARCHING

(i) Chose the option S - Search Formulation:

Type S

(i) Using Right Truncation

At the edit prompt 'Boolean expression',

Type:-

ARTS OR FILMS

- All the terms beginning with ART will be displayed:

   Set 1 ART

P =   1 ART

P =   1 ART BOOKS

P =   4 ARTS

P =   1 ART HISTORY

P =   1 ARTISTIC CREATION

T =   5 - $6: ARTS

T =   5 - $1: $6

P - stands for the postings count, indicating the number of times the terms occurs in the database.   Fir instance ARTS occurs 4 times in the database.

T - indicates the actual number of records found by the search.

   The search of ART retrieved 5 records.

(ii) Qualifier

- limiting the search to certain fields only.

Keyword/(TAG)

eg. WATER/(24)

In this example TAG 24 is the title.

(iii) Logical Operators

(a) OR - the Class Union Operator.

        - denoted by the + sign.

         e.g. Term A + Term B

- This will retrieve all records containing Term A, or Term B, or both terms. It broadens the scope of the search.

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(b)   AND - Class Internation Operator
      - denoted by the * sign.
        eg Term A * TERM B
will retrieve all records that contain term A term B together.
this narrows the search.

(c)   NOT - Class Exclusion Operator
e.g.   Term A NOT Term B
will retrieve all the records that contain term A not term B.
(iv) ANY TERMS
- collective term standing for a group of access points e.g.
BOLESWA
SCANDANAVIA
BENELUX
The term BOLESWA will extract records on Botswana, Lesotho and
Swaziland.
P - Save Search Results
  - enables you to save the results of a search so that you
    any print later.
D - Display Search Results
    Displays on the screen the results of a search just
    carried out.
R - Recall Query Formulations.
    Displays the set of search expressions created during the
    current session.
G - Execute Previous Search.
    allows you to re-execute (optionally edit) a previous
    search expression.
F - Change Display Format
      (1)   pressing F displays the default format.
      (2)   press F6 which deletes the default format.
      (3)   type @ CDS1 <CR>
      (4)   Browse - and the display will be different

E – Data Entry

Enables the user to enter or input data into the databases.

When this option is chosen, a data entry menu EXE1 is displayed. The menu offers the following options:

L – Change Dialog Language

W – Selecting Worksheet

N – Create New Record

- when adding new records into the database, this is the option to use.

E – edit Record or Range

- Enables the user to edit a specified or range of records. The user responds by supplying record numbers (MFN).

R – Revise Search Results

- allows you to edit the set of records retrieve by the last search expression. The records are displayed using the current worksheet.

P – Recall Last Record

Re-displays the last record that was processed in the current session.

D – Define Defaults

The user is allowed to predefine one or more of the fields.

This is useful where a number of records have one or more fields in common.

C – Clear Defaults

Clears any defaults that may have been defined using option 'D'.

M – Display Next MFN to assigned

Displays MFN to be assigned to the next record in the database.

X – End Data Entry.

CREATION OF NEW RECORDS

(1) Option N creates a new record
(2) CDS/ISIS displays the currently selected worksheet.
(3) Bottom line of the screen indicates the MFN of the record
     you are about to create.
(4) To fill field - type and terminate with <CR>.
     CDS/ISIS will then position the cursor at the beginning

     of the next field.
(5) To leave field empty, simply Press <CR>
     <TAB> to return to previous field
     <F1> display any help message which was displayed when
     the field was created.
     <F2> Erase the displayed default field.

RECORD EDITING

The record is displayed plus the MFN, and an edit menu at the
bottom of the record.

M - to edit record
D - to delete record
C - to leave record unchanged
R - to restore the screen
T - leave record unchanged and interrupt the revise operation.
<CR> - to page forward (display the next worksheet page)
 B - to page backwards

RECORD DELETION

Deletes record logically but not physically, ONLY when you re-
organise will records be removed physically.

SPECIAL DATA ENTRY RULES

There are characters which CDS treats as control characters,
rather than data characters:-

Subfield delimiter ^a - a two character code preceding and identifying a subfield within the a field. There should be no space before or after a subfield delimiter.

SEARCH TERM DELIMITERS

/ / < >   used to enclose access or search terms.

REPEATABLE FIELDS

- the % sign.
- used for repeatable field, to enter more than one occurrence.
- always make sure that there are no spaces around the % sign.

PATTERN TYPE FIELD

The field to be entered will be displayed according to the field pattern to guide you in the entry of the field.

X - the position may contain any alphanumeric character.

A - the position may contain any alphabetic character.

9 - the position may contain any number.

    e.g. 99/99 - the field may only consist of two numbers,
        a slash, and followed by 2 numbers.

END OF DATA ENTRY/EDITING

X - EXIT, take you back to the main menu. Where you type
    X - to exit.

When you exit CDS/ISIS will want to know if you wish to update the inverted file by using an edit prompt. You reply Y or N. If Y CDS/ISIS will update the Inverted File. If N, the inverted File can be updated later using programme ISISINV.

INVERTED FILE MAINTENANCE

The Inverted File is updated/created using by using information provided in the FST. Each line on the FST determines how a particular access point should be indexed. It contains the following:

1) Tag

2) Indexing Technique

3) Print Format (determines how the field is to be extracted).

INDEXING TECHNIQUES

0 - each line extracted by format

1 - each subfield/and or line

2 - < > each field in triangular brackets.

3 - / / each field in slashes

4 - each word - one needs a stopword file.

The Inverted File can be updated immediately after data entry or using the ISISINV program.

ISISINV PROGRAM

As noted above ISISINV can be used to create, update, back-up, restore or print the Inverted File.

F - FULL INVERTED FILE GENERATION

Creates the inverted file. This function can be used the first time one creates the Inverted File. Otherwise use the Inverted File update function provided by CDS/ISIS.

Also used if you change the FST, otherwise there will be inconsistency in the database because records added or modified after changing the FST will be inverted differently from those created by the change.

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CONSISTS OF 3 STAGES

- creation of link file
- sorting link file
- loading sorted link file into Inverted File.

U - Update Inverted File

Use it after data entry or during ISISINV

B - Inverted File backup

G - Create unsorted link file

S - Sort Link File

C - Load Inverted File

D - Dump Inverted File - listing Inverted File includes terms
and postings. The Inverted file is copied to a disk file
IFLIST.

LST which can be printed later.

P - Print Search Term Dictionary. For each term CDS/ISIS will
also sent to the IFLIST.LST. for later printing.

PRINT FORMAT LANGUAGE

Used for: Display on the screen.

Printing

FST

Basic Format

Vtt ^(m,n) V = Display the contents of this field.

tt = tag of the field.

^x - subfield identifier - e.g., if the field is divided into
subfields one can print the subfielded part of the field.

(m,n) - optional

 m - 1st line of the field should be indented by M characters
(only when the field is displayed on a new line).

n - 2nd and consecutive lines should be **indented by N number f
characters.
e.g. V24(1.14) - means Print field 24, 1st line at
position 1 and subsequent lines at position 14.**

HORIZONTAL AND VERTICAL SPACING

xN Insert N spaces before the next field.

Cn - skip to the line position in n causes the next field to
    be displayed at the next line.

/ - space to new line if previous line is not blank
    (causes the next field to be displayed in the next
    line.)

$ - space to next line unconditionally.

% - Deletes previous blank lines (if there are any). Checks
 backwards if previous line is blank, it is deleted.
 Constants.

 Unconditional - constants which are always included in the
 output regardless of the presence or non-presence of fields
 in a record.

                eg ' - ' etc.

Conditional - constants will be included in the output
provided the associated field is present in the record
    e.g. "Authors" V70.

REPEATABLE LITERALS

Defining conditional constants Groups which will be repeated
for each occurrence of a repeatable variable field.   The
repeatable constants are enclosed in vertical bars| : | (where
' : ' will be output after all but the last occurrence of the
repeatable field.) Pre-Lit - e.g. 'Authors" V70 | : | + (:
will be output before all but the 1st occurrence of the
repeatable field.)

Repeatable Groups

Consists of a set of print parameters enclosed in parentheses.
E.G.
(V10/) - will format each occurrence of V10 on the line.

ISISPRT
Allows printing output of a given search, saved using the 'P "
option of ISIS OR to print a selected range of records.
TO CALL ISISPRT
(1) Type ISISPRT
(2) The menu xXPRT will be displayed. There are two choices
     printing:-

 P - Print using the standard specifications. Selecting this
     option results in the display of the system worksheet
     xXPRT which contains the page layout parameters.
S - Print to your specifications, allows you to use a
predefined layout worksheet.
(3) Select P and fill in the following parameters:-
(a) Database name - enter here the name of the database CDS.
(b) MFN - enter here the range of MFNs to which the print
          run will apply - 1/20
(c) Save file Name - this is filled only when you are
     printing the results of a saved search.
(d) First Title, Second, Third etc. CDS allows you to print
     up to three lines at the beginning of your page.
(e) Print Format - you enter the print format to be used.
     This may be a pre-defined format or one that you devise
     there and then. Predefined formats must be preceded by
     an "@" sign.
(f) Line Width - indicates the maximum line for printing.
     This may not exceed the maximum number of print positions

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on your printer. The default given by CDS/ISIS is 70
characters.

(g) Number of Columns

Determines the number of columns that may be printed.
The default is 1 column.

(h) Column Width

If more than one column is specified, then the width of
the column must also be given. The difference between
the column width and line width gives the spacing
between the columns. For example specifying the line
width of 34 characters, and column on two columns, will
ensure that there are 4 characters between the two
columns. The default value is usually 70 for one
column.

(i) Lines/Page - specifies the maximum number of lines per
page.
The default is normally 60, but you can change it
according to the size of your own page.

(j) First Page Number This specifies the starting page
number.

(k) EOC Tolerance - Indicates the number of lines which must
be present on the current column before printing a
record. If less than the indicated number is present,
the record will be printed on the next column or page.

(l) Data Indentation - Indicates indentation of each level
of heading (used only when you have headings). It
functions   only in connection with a sort worksheet.
The default value is 0.

(m) Sort - If a sort is required then type Y, and if not,
type N. Where no sort is required, the records are
printed in ascending MFN order. If Y is specified, then
CDS/ISIS will display sort specification worksheet
xXSPRT. The default is N.

(n) Sort Worksheet Name - This is used normally where you

have predefined sort parameters. In that case, you
enter here the sort worksheet. If this field is left
blank, CDS/ISIS will provide the system worksheet
XYSPRT.

(o) Print File Name - You may print your output directly on
to the printer or write it to file of your choice. If
the field is left blank CDS/ISIS will write the output
to a file called PRINT.LST, which you can always print
afterwards. In this case write the name LPT1 to print
afterwards. In this case write the name LPT1 to print
directly to the printer.

PRODUCING SORTED REPORTS

(1) Call the ISISPRT programme and select S.

(2) Fill the menu as above, with the exemption of the SORT.
field, where you must fill Y.

(3) SORT WORKSHEET

(a) Number of Headings - Indicates the number of headings
levels required. This must be equal to the number of
sort keys.|

(b) Stopword File Name - This should be supplied if you are
using indexing technique 4. the stopword file contains
a list of non-significant words. CDS/ISIS will ignore
words listed in this file while building the keys.

(c) heading Format - CDS/ISIS default format leaves one
blank line before each heading and one blank line before
the first record printed under the last level heading.

(d) Sort key Parameters
There may be up to 4 sort keys for which the following

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parameters must be supplied.

Keylength - size of the sort key. Specify a length that is sufficient for your field. In this case fill 20.

Multiple Key Indicator - indicates whether CDS/ISIS should build a single sort key or one sort key for each element produced by the FST.

0 - for single generation

1 - for multiple key generation.

In this case we are sorting by author, and the field is repeatable, enter 1.

FST   - defines the contents of the sort key. You can give a pre-defined FST E.G., . (a) CDS or provide an actual FST.

In this case enter 1 0 (V70/).

For the second sort key enter: length = 70 multiple key indicator = 0.

FST = 2 0 V24

Valid the entries by pressing <CR>

DEFINING A NEW DATABASE - USING ISISDEF

To use ISISDEF, you type ISISDEF <CR>. The program allows the user to define a new database you create the following:-

(a)   Field Definition table (FDT)

(b)   Data Entry Worksheet

(c)   Field Selection Table (FST)

(d)   Display Formats

When you first select ISISDEF, the menu EXDEF is displayed which offers the following:-

L - Change dialog Language

C - Define new database

X - Exit

In this case we will select C to define a new database. To the prompt 'database name' type TESY <CR>. This tells the system that we want to define a database called TEST. the

database name can be 1 - 6 characters long.

(a) Defining the FDT

CDS/ISIS will ask you to define the FDT.

As noted before, the FDT requires certain information to be filled in. Out FDT will look like the one below:-

TAG	NAME	LENGTH	TYPE	REPEATABLE	DELIMITER
NAME		20	X		B
2	ADDRESS	100	X	R	
3	CITY	100	X		
4	COUNTRY	100	X		
5	FIELDS OF INTEREST	30 .	X	R	

Type the FDT as indicated below:-

1. Name <CR> 50 <CR> X <CR> b <CR>
2. Address <CR> 100 <CR> XR <CR>
3. City <CR> 100 <CR> X <CR> <CR>
4. Country <CR> 100 <CR> X <CR>
5. Fields of Interest <CR> 30 <CR> AR <CR>

When you have finished, you may need to edit certain fields and you use the M facility in the field editor displayed below the FDT.

(b) Defining the Data Entry Worksheet.

CDS/ISIS brings you automatically into the worksheet definition by displaying an empty worksheet. It is on this worksheet that you will enter the fields defined in the FDT:-

(1) To the prompt 'e"ter the field Tag' ; enter the Tag of the first field to be put on the worksheet - Type 1 <CR>.

(2) You will be asked for the positon on the screen where the field should appear. CDS/ISIS normally displays the next available position and in this case it is 1/1 - this means line 1, column. Let us accept the position: press <CR>.

(3) The name of the field 1 will be displayed in the specified position. The cursor will be positioned at that field - this allows you to edit the name if you wish. To accept the name, Press <CR>.

(4) You will be asked next for the position of the field value.
CDS also displays the next available position which in this case is 1/5 - line 1, column 5. Reply 1/20 <CR> placing the field value at line 1, column 20.

(5) You will be prompted to provide the visibility attribute. The options are:
0 - Normal   1 - Retrieve   2 - Bold   3 - Underline

4 - B
In this case let us use Bold, Type 2

(6) CDS then prompts you to enter the fielf length. The length of your particular field will be indicated in parentheses, e.g. (50). This corresponds to the length given in the FDT.
Press <CR> to accept it.

(7) You will be asked to enter a default value for the field. Press <CR> since there will be no default.

(8) CDS will then prompt you to enter the next firld. Enter the next fields as done in steps 1 - 7.

(9) After the last field, CDS prompts you to define the next field. Since there are no more, simply press <CR>.

(10) Submenus will be displayed in the message area. Type S to Exit and save.

(c) Defining the Display Format

Enter the following:-

MFN/MHL, VO1/VO2/VO3/, "("VO4")/," FIELDS OF INTEREST:

"vo5 (0,4) + | ; |

When the format is correct Press <CR>

(d) Defining the FST

(1) CDS displays a screen for the FST.

(2) We will make all the fields except the address searchable

1 1 VOL^b builds an element from each subfield.

3 0 VO3 builds an element from each line.

4 0 VO4

5 & VO5 builds an element from each term/phrase enclosed
in / /

This is how you will enter:-

1 <CR> 1 <CR> VO^b <CR> etc.>

As soon as you are finished type X to exit.

(e) You are now ready to do data entry using the program ISIS.

(f) After data entry, use ISISINV to create the Inverted File.

(g) You are now ready to search and print your database using

ISIS and ISISPRT respectively.

SECTION 2

INFORMATION RETRIEVAL WITHOUT COMPUTERS

J.R. Neill and B.Grand

SECTION 2

INFORMATION RETRIEVAL WITHOUT COMPUTERS

J. R. NEILL AND B. GRAND.

(June 1989)

INTRODUCTION

The import of information technology (IT) into Africa's urban landscape is clearly evident to the newly arrived tourist, business traveller, 'expert', or foreign aid consultant. From their first entry at the international airport through to their stay at the five star luxury hotel, as well as visits to banks, offices, and commercial enterprises, such visitors cannot help but become impressed by the evidence of the computers' entree into Africa.

However there is unfortunately one place where the casual visitor is unlikely to find the 'new' IT revolution that is transforming the rest of the world. This is ofcourse in the region's libraries. Information Technology has, to date, left the region's libraries unhindered and undisturbed. Computers have had minimal impact upon the Libraries in Southern, Central and Eastern Africa so far. However, there are encouraging signs that this situation is likely to change in the foreseable future.

At the same time the obvious awareness of the importance of Information Technology is causing many of the region's librarians a great deal of heartache and anguish. In

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particular those whose Library does not possess a computer feelig seriously handicapped and inadequate. This situation is particularly pronounced in the numerous small Library and information centres that proliferate throughout the region. Most of these Libraries are staffed by one (if they are fortunate two) trained librarians, using method and tools more suited to large public Library. Meanwhile they anxiously await the unlikely arrival of a computer which they imagine will provide a magic solution to all their problems.

While they wait it would be useful to try and bridge the gap between the inappropriate methods and tools that they currently employ and the obvious benefits they will undoubtedly enjoy the day they install a computer. This module has been produced specifically to demonstrate that it is perfectly possible to develop a comparatively sophisticated information retrieval system in a 'one-man' Library which does not rely on IT. Neither will the system depend on general classification schemes (such as DDC) or complicated cataloguing rules (such as AACR2. Instead the guiding principle will be - what can one person with fairly limited resources achieve fairly quickly with an economy of time and effort?

Priliminary Steps to Developing an Information Retrieval System.(1)

Prior to effecting any major changes or developing a completely new information retrieval system it would seem essential to review and evaluate what is already in place. Naturally a vital preliminary to this is to describe how your users are presently able to access your collection and to determine what problems they encounter.

. Spend a few moments thinking about your own Library
  and then try to describe the tools that are currently
  available for retrieving information. Conclude your
  description by highlighting the problems your users face
  because of the inadequancies of the methods and tools
  you employ.

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(1) The ideas and content in this section are based on based
    on S. A. Webb, Creating an Information Service. ASLIB,
    1983.

In addition to getting to know the strengths and weaknesses of
the information retrieval system used in your Library, there
are a number of additional tasks that need to be undertaken.
While these tasks are not directly related to information
retrieval, they are nevertheless important and must be
undertaken if you are serious about improving the service you
offer you users.

The three priority tasks should not detain us too long,
moreover as they will be dealt with in the management module
of this course. Nevetheless a brief consideration of how to
increase your knowledge base of the organisation and the
Library in which you work would be useful at this point.
.KNOW YOUR ORGANISATION

Outlined below is an example of the sort of checklist of
questions that you ought to be able to answer about your
organisation. Study the checklist carefully and then consider:
 1. whether you could provide the information it requires, and
 2. what changes you would have to make to the list to make it
    applicable to your organisation.

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Checklist 1: The organisation

(1) Type of business activity and clientele

(2) Possible related subject areas

(3) Number of sites and offices

(4) Location of sites and offices

(5) Number, names, function and location of all staff

(6) Document production facilities and materials

KNOW YOUR INFORMATION RESOURCES AND SERVICES

Once you know something about the organisation in which your
Library and information centre is situated - the next
questions relate to the information resources you have and the
services you offer. Outlined below is another basic checklist
dealing with this topic and is provided to enable you to
describe the level of service your Library is offering. In a
similar way, as you did previously, attempt to work through
the checklist and at the same time adapt it so that it can be
utilised within your Library.

Checklist 2: Information sources and Services

(1) Relationship to parent organisation.

(2) Scope of subject coverage

(3) Source of information resources

(4) Type of information resources

(5) Facilities for in-house production

(6) Currency of stock

(7) Present utilisation of stock

(8) Instruments for retrieving information

(9) Physical organisation of stock

(10) Information services offered.

KNOW YOUR SERVICE CAPACITY

The third and final consideration, particularly in a 'one-man'
Library, is to determine your capacity as a library to provide
the type of service that you would wish to offer. Some of the
questions that need to be asked in this context are provided
below in checklist 3. After studying it, see how many other
points you can add.

Checklist 3: Information Service Capacity

(1) Staff

(2) finance

(3) Phyiscal facilities

(4) Computer facilities

(5) Management and administrative procedures

(6) ????? See how many issues you can add and elaborate on
    those already listed.

We have completed the preliminary tasks associated with
setting up our information retrieval system. Much of the work
has simply been concerned with asking questions. This has not
been a wasted effort for answers to those questions will
provide us with many of the necessary clues as to what type of
information retrieval system we should develop.

BASIC STEPS IN DATA STORAGE AND INFORMATION RETRIEVAL (2)

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The three major characteristics of your Library and
information Service will undoubtedly be:
. Small staff - one or two at the most with only you having
  received some formal training.
. Small collection - narrow in scope, confined to five or
  six major subjects only and mainly comprising 'grey' or
  unconventional literature.

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(2) The ideas and contents of this section are based on C.
    N. Fernu, Simple methods of document retrieval
    and Information Retrieval ILo, 1980.

. Small clientele - 30-40 potential 'hard-core' library users
  at the most but with very specialised information needs and
  with little time to retrieve that information.
  Obviously in such circumstances it would be pointless to
  even try to develop a sophisticated system. Indeed to do
  so would be impossible . Instead what you should be aiming
  to create is a simple, easily managed information
  retrieval system. Even though the system your areas of
  concern are exactly the same as if you were developing a
  computerised system. These concerns are:

    . HOW TO CLASSIFY YOUR DOCUMENTS
    . HOW TO CATALOGUE YOUR DOCUMENTS

The classification of documents is, as you know, one of the
core tasks of the Librarian. It basically divides the subjects
up into a hierarchy of categories which form the basis for
arranging those documents on the Library shelves. The systems

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most commonly used in the majority of the world's Libraries
are Dewey, UDC, and Library of Congress. Worthwhile as each of
these schemes are, they nevertheless are not ideal for the
type of Library in which you are working or the type of
collection with which you are dealing. Fortunately there are
other ways of classifying documents by subject which are more
appropriate to your needs. For example if you were working in
a Library that dealt exclusively with trade union and labour
documentation you could first of all produce a simple
classified list of subjct areas directly related to that type
of material as follows:

| SUBJECT AREA | INDUSTRIAL RELATIONS | 01. |
| Category | TRADE UNIONS | 01.01 |

Sub-category	Structure and functions	01.01.01
	Goals and Policy	.02
	History	.03
	Rights	.04
	Finance	.05
	Membership	.06
	Meetings	.07
	Education	.08
CATEGORY	TYPES OF WORKERS	01.02
Sub-category	Domestic Workers	01.02.01
	Migrant Workers	.02.
	Rural workers	.03
	Professional Workers	.04

AND SO ON !!!!!

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Then if you wanted to classify a book that dealt with the following subject:

THE HISTORY OF THE MINER'S UNION

You would put it under the number - 01.01.03
and an alphabetical entry could be produced which looks like this - Trade Union History/Miners - 01.01.03.01.
Naturally a task like this is quite involved and requires quite a bit of subject knowledge. However, try and think of the subject scope of your own library and try to create at least the basic structure of a list of subject headings which you could use as the basic for a classified list. In performing this task it would be ideal to use your own library. In particular the reference materials and possibly any published indexes and thesaurus which may be of help.

. HOW TO CATALOGUE YOUR DOCUMENTS

However small your library is and however understaffed it may be, an effective cataloguing system for the efficient retrieval of information is essential. As you are well aware a catalogue is quite simply a comprehensive list of all the contents of your library. One does not necessarily need to spend countless hours ensuring that your catalogue entries conform to international standards. The basic elements of bibliographical detail will suffice set out in a standarised format with a simple level of punctuation. For example:

    Smith, Robert, The Role of Trade Unions in
    Social Development. Forsite Press, Dublin,
    1979, 114pp.
    Historical example of positive influence of

union activities in community affairs.
03.04.02.187

Spend some time discussing amongst yourselves the type of a
catalogue entry you feel appropriate for your own type of
library, the level of bibliographical description that should
be included, and the points of access you should provide in
your catalogue. However remember that we are talking about
work in a 'one-person' library so keep it simple.

UTILISING YOUR INFORMATION RETRIEVAL SYSTEM (3)
Naturally one of the most important areas of your work,
especially in view of the limitations of your effective
library service, is to exploit your information retrieval
system to its maximum potential. The most obvious way to do
this is to develop a manual CURRENT AWARENESS or DSI SERVICE.
Once again do not be put off by the seeming complexity of such
a task for it can be effective without necessarily being over
sophisticated. Such a service whether manual or computerised
will comprise four essential components:
  . Your library users who want to know on a regular basis
    what is coming into the library but who invariably do not
    have the time to look for the material themselves.
  . Your own knowlegde of what subjects your users are
    interested in.
  . Your own in-house information retrieval facilities that

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will enable you to scan, locate and retrieve information.

. Your own in-house facilities for communicating with your
  users, providing them with the information and/or
  documents they require, as well as a feed-back
  mechanism that will enable you to adjust and improve the
  SDI system as a whole.

Spend some time thinking about your own library and then
describe any activities that take place that could be said
to form part or even all of an SDI Current Awareness
Service.   Indicate   the   scope   of   the   service,   its
limitations, and what you feel is necessary to make it
more effective.   If on the other hand you do not operate
anything remotelly like an SDI service in your library try
and answer the question - WHY NOT?

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(3) The ideas and content of this section are based on T.
Whitehall. Persoanl Current Awareness Service: a handbook of
techniques for manual SDI. British library, 1979.

It is obviously beyond the scope of this module to describe
and   detail   the   various   techniques   in   establishing   and
developing an SDI system but it would be useful to work
through a checklist of items and questions that will form a
basic foundation for establishing such a service when your
return to work in your library.   Quite probably many of you
will not as yet have developed an SDI system in your library
even though the checklist will assume that you have.

Nevertheless it will be very useful to spend some time working
through the checklist as it will indicate some of the basic
questions you will have to answer when setting up an SDI
system. Work through and discuss the questions posed in the
checklist; and when you have finished see if there are any
other items that you think should be added to the list.

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CHECKLIST 4 ESTABLISHING AN SDI OR CURRENT AWARENESS SERVICE

(1) If an SDI system already exists, when was it established,
     by whom and why?

(2) Who is the service presently catering for?

(3) Where do they work in relation to your library?

(4) What does the service cost?

(5) Are there any other competing services available either
     within the organisation or based on other libraries?

(6) Have there ever been any user studies conducted by your
     libraries?

(7) If such a service exists in your library who operates it,
     what qualifications do they have and what specific
     training have they received?

(8) How are new users informed of the services?

(9) What major subject areas are covered?

(10) Is the service for individuals and/or institutional
     projects?

(11) How many users and potential users are there?

(12) How often on average do you notify your SDI users of new
     documents or information?

(13) What is the form of notification you employ?

(14) How do you find out about your users interests?

(15) What feedback procedures do you employ?

(16) What information sources do you scan - Primary,
     Secondary or   what?

(17) How are users needs recalled?

(18) Do you prepare abstracts?

(19) Are they indicative or informative?

(20) Do you employ a standard format for notification of an
     item?

(21) What classification and indexing method is employed ?

(22) How are individual SDI items routed to individual users-
    what distribution methods are used?

    Conclusion

The best way to conlude is for you to evaluate what we have
covered in this module and that can perharps best be done by
posing two final questions:
. is anything you have covered in this module likely to change
  the way you work in your Library - and if so what?
. If you had been the one producing this teaching module for
this course what material if any would you not have included
and what new material if any would have included and what
new material would you have dealt with?

SECTION 3

MANAGEMENT PRACTICE IN SMALL LIBRARIES AND INFORMATION CENTRES

K. Mchombu

MANAGEMENT PRACTICE IN SMALL LIBRARIES AND INFORMATION
CENTRES

K. MCHOMBU

LIBRARY PLANNING

CURRENT TRENDS IN LIBRARY AND INFORMATION SERVICE DEVELOPMENT

LEARNING OBJECTIVES

After studying and discussing materials presented in this
sub-section the participant should be able to;

1. Identify the main trends and issues which are
    emerging in information provision to Users.

2. Obtain an overall picture of the ideas and
    concepts which will be discussed in the latter
    part of this section 'Management Practice in small
    Library/Information Centres'.

CURRENT TRENDS IN LIBRARY AND INFORMATION SERVICES DEVELOPMENT

In the development of all human endeavours 'nothing' is
static. Philosophers have said many times that the only
permanent state in life is change. In the Information
professions, such change is often rapid, especially if we
adopt an international than a parochial view point.

This lecture and discussion is devoted to an appraisal of the major trends which are currently taking place in the library and information services sector both globally and in the context of Africa.

The discussion has the following objectives:
1. To increase your awareness of the main trends which are emerging in information provision to users.
2. To introduce you to concepts which will be taken up

   and expanded in the latter part of this module.
3. To introduce you to ideas into which you can fit your experience and come up with some solutions to the problems facing you at your place of work.

In this discussion we shall discuss the following points:
   1. A comparison of developing and developed countries.
   2. Alternative ways of providing information.
   3. Information technology.
   4. Performance accounting.
   5. Resource sharing.
   6. Marketing of information services.
   7. Charging of services to users.

1.1. A Comparison of Information Practices in Developing and developed Countries.

If we are to compare the information practices and dynamics in underdeveloped countries with those of highly industrialised countries, we notice that there is   a sharp contrast in almost everything.   The most   profound   changes   in   the information sector are taking place in the developed countries the so called 'First'   world.   For example, all categories of

users from the primary school child to Secondary School
students, up to College and University students and
Researchers have a proliferation of journals and books to
provide them with a variety of viewpoints on their subjects
of specialisation, those who wish to read for leisure have
excellent Public libraries within easy reach to serve
this recreational need. Computers and microcomputers and
other forms of Information Technology are used
extensively, and an increasing number of people have
personal computers (CP's) both at home and at work.
In short, the information environment in industrialised

countries is one which is dynamic, and these countries are
rapidly changing into knowledge centred societies. A number
of writers have concluded that these countries should no
longer be called Industrialised Societies, but Information
Societies because dealing with information is the biggest
industry in their economics.

By contrast, information services development in the so-called
Third World in general, and Africa in particular appear to be
slow at best, and staginating or retrogressive at worst. For
example, in most of our countries, less than 5% of the
population has access to libraries, Primary School do not have
any libraries, neither do many Secondary Schools. The
situation is better for Colleges and Universities, but at
present in most countries in Africa, Universities are finding
it difficult to purchase up to date materials because of
shortages of foreign exchange. Researchers and othe
specialists have become out of from the global developments in
their areas of specialisation because they do not have easy
access to current sources of information. Many Libraries do
not have qualified workers, and often, where qualified people,
are available, they act as if they are unqualified.

Hence a comparison of current trends in LIS developments between developing and developed countries ends up being a contrasting of encouraging developments in the First World the and stagnation of in LIS the Third World. Sometimes however, such a negative conclusion is the result of using a perspective which lacks a historical dimension; the LIS infrastracture existing now in developed countries did not blossom overnight, it was a lengthy and sometimes painful process dating back to the 17th and 18th centuries. The development of LIS in the First World should not be ignored, but neither should Black Africa ignore its cultural and historical accomplishment over a comparatively short period ot time.

In order to benefit from the experiences of developed countries, it is also necessary to view their LIS development within the context and conditions in which they exist, otherwise the blind copying of such institutions will not provide the solution hoped for, because such copied models will simply die out after a few years if conditions required to give them a long life are lacking.

1.2. Alternative Ways of Providing Information

Traditional 'librarianship' was identified with a place 'the library' and a particular information medium 'the book. This has led to an overdependence and unnecessary idolation of 'books' over other information mediums. In some situations this has led some libraries to keep old- out of date and misleading books on their shelves, because if these are weeded out 'shelves will be empty. This ideology has also led to complacency in developing innovative services to suit user needs based on other

types of materials and information provision approaches.
According to 'books' the same status as 'a bible' or
'koran' is given by Christianity or Islam has led to
inbuilt rigidity and self limiting approach to servics.
Needless to add, this has been compounded by the
treatment of a 'library' as a church or Mosque. Often
there is a belief that this is the only legitimate
place where information services can be offered.
In Africa, this has led to Libraries offering a minimum level
of servie without much creativity and innovativeness. In many
of our libraries this minimum services involves storage of
materials, lending and reference services, and some very
limited extension services e.g. postal lending, book boxes and
mobile/delivery vans.

Such services are based on the assumption that all the users
are highly educated and their main information acquiring habit
is through reading. The reality, however, is quite different,
library and information services have a variety of users, who
have different information services have a variety of users,
who have different information use habits and information use
constraints (e.g. illiteracy) thus requiring flexibility in
information delivery techniques.

The variety of services/approaches which can be offered
include the following:
. Notification services (e.g. contents page circulation).
. Repackaging of information.
. Resource persons files/lecture-schedules.
. Abstracting and indexing bullettins.
. Story telling, play acting, puppet shows etc.
. User education.
. Identification of user needs.

These are just a few services/approaches, but it does not mean each library will be offering all of them. Obviously this will be dependent on the objectives and user needs of a particular library, and the skills of its staff.

1.3. Information Technology

In Library and Information services today IT is one of the most rapidly growing areas with the computer, and micro-computers at the centre of the state. However, IT is not to be equated with computer only; other technologies include; Audio-Visuals (e.g. T.V. Videotex, slide-projectors etc). Optical Discs eg CD ROM (compact Disk, Read on Memory only) which can produce texts and graphics, telex and telefax, microfilming, Audio_recordinfs, to mention but a few.

IT has become crucial in information provision because of a number of reasons:
1.   It lightens the burden of handling routine work to invest time on dissemination activities, and more scientific methods and practices.
2.   Very useful in identifying needed information quickly e.g. by use of a database.
3.   One can obtain comprehensive, and current references quickly and inexpensively.
4.   Transforming isolated resources into a limitless pool of information.
5.   Users can obtain both print and Audio-Visual based information.

It is now common to find computerized systems for acquisition, cataloguing, file construction etc. The growing popularity of IT is partly because of the decreasing prices of computers and micro-computers   so   that   they   can   be   bought   by   most

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organizations and individuals.

1.4. <u>PERFOMANCE ACCOUNTABILITY</u>

The provision of library services, over the years, has been
carried out without a high level of cost-benefit
consciousness.   It was always believed by librarians that
since theirs is a non-profit service exact measurements of
efficiency are unnecessary, if not impossible.   In addition,
since most librarives were assured of their annual subvention
irregardless of their performance levels, this has created an
attitude of complacency and non-accontability to Users.
Librarianship has been isolated from users mainly pre-occupied

with 'looking after books' and other in-house chores' and
completely ignoring contact with users.   Generally, the more
senior a person is, the further she/he will be from users in
some hidden office or the symbolic glass/plywood cage.

Planning and Management for productivity is not merely devoted
to carry out unquestioned routines because this is how it has
always been done, but it calls for measuring the impact of
services offered against set objectives.   For example an
assessment of a Public Library Services by finding out what
percentage of all potential users actually use the service?
It is 1% or 2% or 5%?   How do these users rate the service
they get?   How are they involved in service and development
improvement?   How effective is our collection in meeting user
needs?

Performance Accountability (PA) means always asking ourselves
question, studying the environment/conditions under which we
are providing information, and coming up with
suitacle/appropriate strategies.   PA also means taking a cost-
benefit approach to our services rather than being complacent

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on how we use resources to meet information needs. PA is
another growing trend in the profession.

1.5. MARKETING OF INFORMATION SERVICES

It is increasingly becoming obvious that one of the ways for
increasing use of library and information services is through
marketing, and promotions of the services. Its basis is
finding out what/where the demand for informations and
designing services which can supply inforamtion which is
compatibe with needs.

Another important component of marketing is promotional in
nature i.e. an educational drive to promote information use in
different segments of society using defferent media, fairs,
competitions etc.   Promotion may also involve library
participation in national and internation events and themes:
eg. international childrens day, International Apartheid day,
Mothers day, adult Literacy day, Agricultural week, etc.

However we should never forget that the backup to promotion
and marketing is good services and relevant information
resourcs-without these, marketing becomes a farse and a
wastage of time.

1.6 RESOURCE SHARING

It is now realised that no single library, working along can
satisfy all its users needs all the time. The sharing of
resources both nationally and internationally has been a fact
of information provision for a number of years. However, in

most developing countries, this reality has not yet become a fact. The situation whereby each library is guarding its possessions jealously is still the norm rather than the exception.

At the international level its possible to borrow items from the British Lending Library through the British Council or using the USIS have access to similar institutions in the USA. At the national and regional level, however, basic resource sharing tools such as union catalogues, union lists of serials, regular accessions lists, national bibliographies are not fully developed.

1.6   INFORMATION FOR SALE

In western countries especially those under right-wing regimes the philosophy of a free 'Library Services which has guided library development since the 1950's (see Unesco Public Library Manifesto) is under serious challenge.

The question is being asked wheteher library and information services should continue to be offered free to the public? Information provision has become expensive especially scientific and technical data in electronic formats and the need for increased funding for hardware and software etc. are over-straining the financial menas of the average library.

What is being envisaged is that the burdent of payment is shifted from the taxpayer to the user, but low-income-bracket users, children, and other weaker segment in society will most likely find this new trend is to their disadvantage. In

underdeveloped countries where wide information use habits are still at a formative stage, the introduction of payment by users may stunt the growth and development os such services. This may be one of the reasons why most Developing countries have viewed the commercialisation of Information provision with reservations.

REFERENCES

1. Hishim, Abba, Problems facing Public Libraries in developing countries - in Libri, vol. 36 no. 4, 1986 p. 297-312.

2. Shaham, Snunith The Public Library in a Changeable Society; Analysis of Israel Public Libraries, Libri, vol. 36 no. 4   1986. pg.

3. Unesco Public Library Manifesto, in Libr. Ass. Record, vol 75   no.1, 1973. pg.

2. PLANNING LIBRARY ACTIVITIES

LEARNING OBJECTIVES

After studying this sub-section and doing questions at the end the course participant should be able to:

1. Collect facts/data required for planning.
2. Selelct important problems to be acted upon.
3. Set objectives and targets.
5. Prepare a simple plan.
6. Draw up a plan of Action to control implementation.

THE LIBRARTY AND ITS COMMUNITY

The Library/information worker attached to an information centre has a sepcial responsibility to support the institutition/community by acting as a link between the institution and the relevant information users require in order to carry out their functions effectively.

The Information worker, particularly if he/she is newly appointed must get to know the users, and find out as much as possible about their problems and needs in general. Some of these problems may not be informational problems, but they may affect the way people use the information centre.

In running a successful library/information service we face many problems, such as lack of finance, a poor attitude on the part of users and bosses, out of date collections etc. It seems obvious that if we are to obtain some progress in the development of Library/Information services in our institutions we need an intelligent and carefully thought-out

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method of dealing with all the problems and obstacles facing us. Otherwise, we are forced to use trial and error approaches which may or may not always be the most helpful. The method we propose to discuss in this sub-section is Planning Library Activities. To plan is to determine before hand what results/output is possible, how the required output/result is going to be achieved, when, and by who. It is therefore a question of deciding what we shall be able to do, and what we shall be able to do; hence Nyerere's statement: To plan is to choose.

Planning methods can be applied to a large organization such as The National Public Library, or a small information unit within a school. Basically planning falls into five (5) steps.

1. Looking at the situation-objectively.
2. Selecting the important problems.
3. Setting the important problems.
4. Reviewing obstacles and limitations.
5. Preparing the plan.
6. Implementing the plan.

1. Looking at the Situation:

This step is concerned with gathering information and facts which will enable us to analyse the situation within which the library operates.

Methods for gathering the required data/facts incluse:
   - listening and observing in the institution/community.
   - discussions with Management.
   - consulting previous records of the information unit e.g. monthly and annual reports, minutes of meetings, files

in the registry, circulation figures etc.

- Studying census figures, special reports, National
  Library and Information policy, the Organizations Annual
  reports, development plans both at national, district
  levels or institutional level.
- Carrying out a uswer information needs survey.

It is not easy to illustraste what type of data will be
required for all types of information centres which may need
to be collected about a user community, and its information
problems and needs. However, the following broad types and
sources of data may be requires:

TYPES   SOURCES

Information on the User Community:
- what is the total potential user   listening and observing
  in population?   the community. Talking
                                        to people.

- How many are served by the   User Survey/Membership
  library at present?   records

- Age, sex, marital status,   User Survey.
  occupations?

- What is their information   User Survey.
  needs?   Informal Interviews.
- What problems do users face in   User Survey.
  using the information facility.   Discussions with
                                        Users.

- What is their attitude/informa-   Observation.
  tion concisousness?   User Survey.

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- What other information centres/   Observation.
  sources are there?

- Where do the users come from?   User Survey.
                                             Observation.

- New services required by users?   User Survey
                                        Informal discussions.

- Growth per year?   Membership
                                           records. Annual
                                           reports.

Information on the Services
Number of people served each   Registration forms
month\ weekMonthly reports   Monthly reports
week. Number broken down by different   Issue stastics
groups. Kinds of services given/kinds
of questions/qiesries?

Information on the Collection

Total number of materials.   Accession register
A break down by categories of   stock records
materials.
New additions per year.   physical check
Withdrawals per year.
Growth per year.
Kinds of materials used most.
Kinds of materials least used.   Survey
Methods of acquiring 'new' materials
Inter-loan, request, resevation   Monthly/Annual report
Unsatisfied information needs?

Information of Financial Support

Total annual budget of the information   Annual reports.
centre for 3 years.
Government support.   Talking to fellow
Sources of finance.   Information workers.
 Budgeting time schedule.   Discussion with
                                                Bosses.

Rate of inflation.   Talking to donor
Other sources of finance/donor   agency staff.
agencies.

Support packages offered by   Annual Reports
different donor agencies.   Donor Agencies.

Growth in financial resources?

Information on Premises and Equipment

What equipment is available?   Annual reports.
Amount of space for reading, storage,
of materials, office work etc.   Plan of building.
Other facilities.   Observation.

Information on Staff

What is the staff establishment?   Staff reports.
Present number of staff?
Training of present staff?   Personal files?
Needs for training?
Quality of work output?   Observation.
User satisfaction with services
staff offer?

Opportunities for further training?
Library Association activities.
Professional literature journals,
textbooks, manuals etc.

Information on Problems and Issues

Additional information may have to be collected to help in
understanding a specific problem; for example, a visit to the
local bookshop may be needed to see the range of materials
which are available, and the extent of the price markup as
compared with that appearing in publishers catalogues. Or a
meeting with school teachers may have to be arranged for a
Public Library to collect information which will eanble it to
strengthen its School Library services (to find out subjects
to be covered, levels, existing facilities in school
libraries, whether teachers would be willing to serve in a
school library Committee etc).

Information which has been collected must be arranged to
reveal progress over a period of time e.g. 1 year and this
information will be useful in making plans for the next year.
However, information collected must also be analysed, eg. to
reveal percentage growth, patterns of service, gaps in
services.

To sum up, the first step of planning attempts to collect
information which enables us to look at the whnle situation
(including the information environment, the community of Users
existing information services the resources: (financial, staff
and the problems facing the information unit.

2. Problems and activities Identification.

The development of the information unit will be achieved partly through solving problems facing the library and carrying out the required tasks efficiently.
It is not difficult to identify the tasks which a Library should be doing, because the procedure manuals and annual reports, will all be full of such information.

But apart from routine-tasks a library must also identify problems and obstacles to rendering an effective service. We shall look at obstacles in a latter part of this chapter. What is a problem? We can define problems in two ways:
  - as a difficulty existing between movement from the present situation to a future objective.
  - as a felt gap between what is what should be.

It is necessary to define a 'problem' properly it is easy to mistake 'causes' for a problem; an attempted solution may be wrong simply because the cause can be removed without solving the problem.

Which of the following statements represents 'causes' and which represent problems?
a. Many potential users do not come to the library.
b. The people using the Library need instruction.
c. The library is poorly stocked.
d. There are too many old books in the Library.
e. There is no book fund.
If the problem is tated as 'there are too many old books the library'; the effort of solving it may remove all the old books, but people will not increase their use of the library after that.

It is therefore essential to:

  . identify the real problem

  . find out the possible cause

  . decide the different ways to remove the causes.

The Information worker is faced with more than one problem at a time and cannot solve all of them at one go. Prioritazation is the technique of singling out the major problems which deserve immediate action. Limited resources will be directed at solving the priority problems. Some problems may not have priority but because they are simple they are dealt with quickly.

At the end of this step we should be able to develop a list of important problems facing our libraries with their possible causes, and a clear idea of our priorities and those problems outside our jurisdiction.

3. Setting Objectives and Targets

Objectives formulation constitutes an important part of Management, as a whole - and some textbooks the process of Managment is Objectives - driven hence the term Management by objectives (MBO).

In assessing the situation, and analysing the problems, we aso have to take account of available resources e.g. staff, equipment, money, publications, the next logical step os to determine to what extent the problems may be solved or minimised. Some problems take a short' time to solve, others can only be solved in a long time. Others need the Library staff to work closely with other institutions inorder to deal with them effectively.

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An objective can be described as the intended outcome of an effort, activity or programme, so an objective states a specific result to be achieved.

With clear objectives a Library/Information unit avoids the situation whereby a service is provided for years but no improvement is apparent to the parent institution because the information activities have had no set objectives.   In addition, by setting objectives, it becomes possible to continuously   assess   what   is   being   done,   and   evaluate activities after predetermined period.

Setting Objective Enable us to do the following:
1.   It enable us to plan. If we state that the objective of
     the   Ministry of Education is to: equip, maintain and
operate   Public Library Services it becomes difficult to draw a definite plan in a country.   However, if the objective is restated as: To build, equip and operate 2 Public Libraries in district headquaters annually - a plan can be drawn up to try to achive the objective.

 2. It enables results to be evaluated. When a target is
     unknown the results cannot be evaluated, it is impossible
     to tell whether our work is achieved any purpose.
Evaluation is best carried out if the expected results are measurable target but also has a time limit for its implementation.

3.   It accustoms the library to evaluate its performance on a
     continuous basis as part of a results-oriented working
     environment.

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4. Gives staff encouragement when they have something they
   are working to achieve, which leads to increased job-
   satisfaction and enhancement selfworth.

Useful objectives have the following characteristics:
improtant, challenging, feasible, measurable, time-bound.
important - does it contribute to bring progress and it
is important? An objective which states:
   . The   members of staff will have 7 hours of lunch
   time each week is not important nor pertinent.

   challenging   -   an objective must aim to stretch to the
                       maximum the abilities/skills of staff
                       rather than the other way round.

   feasible   -   it must be possible to achieve an
                       objective, taking into considerastion
                       the   resources, obstacles, and other
                       factors.
                       An objective must be observable and
                       measurable, hence the best objective
                       are stated in figures.
However, qualitative objectives may have to be stated in
certain cases.
                       e.g. increase of staff morale, user
                       awareness, user satsfactory etc.
Time-bound -   An objective must show clearly how much
                       work is to be accompanied in a set period
                       of time.

4. Analysis of obstacels and Limitations:

It is important that after setting the objectives we look
at the reasons/possiblities which might cause us to fail: we
should ask ourselves whetherGthere are any obstacles which
might cause us to fail.

The most common obstacles include:

- Skilled staff	- there might not be people with the required skills or lack of people with interest and the morale/motivation to do what is required.
- Funds	- Might be in short supply, or delayed or run out in the middle of a project.
- Equipment/Premises	- might not be available, or too expensive.
- Time	- There might not be enough time to carry out the plan.
- Logistical obstacles	- Roads which are inadequate and possibly impassable in the wet season, lack of postal or telephone and communication services, long distances in large countries etc.

- Social-Cultural factors - People may have low information
consciousness, lack of reading
habits, poor housing.   Also

illiteracy, hard manual labour,
all these may make it difficult
to operate a successful
information centre.

Each objective must be looked at in relation to the obstacles
renged against it, under three headings.

. Can the obstacles be removed?   If not
. Can it be modified or reduced? If not
. Which obstacles cannot be removed?

For example, an objective aimed at providing user education to
all new students in the 1st Semester may have the following
obstacles:
   a - lack of skilled library staff.
   b - lack of user education syllabus.
   c - poor cooperation from teaching staff.
   d - lack of teaching aids.
   e - lack of space in the time-table.

The question is can these obstacle be removed, or modified, or
can't they be removed?   Now let us apply this approach to the
objective stated above and see how it works in practice:

Analysis of Some Obstacles:

Objective	Obstacles	Removed	Modified	cannot be removed
To provide	lack of skills		short course	User education
education	No syllabus		syllabus Committee	
to				start with
students	poor			locally made
	cooperation			charts, and of
	from staff			tape slides
	no teaching			time at start
	aids			of semester
	no slot in			
	time-table			

An interesting outcome of this phase of planning is that some of the obstcles may breed short term objectives of their own so that a major objective, has 'dependent' objectives which are arranges in as a pre-requisite objective to the main objective.

unfortunately it may not always be possible to have a clear vision of all the possible obstacles before starting to implement obstacles arise during implementation which cannot be removed. it has been suggested that because of this a plan should have a 'mobile horizon' to accommodate unforeseen events. In other words, the initial targets and objectives may be revised wether upwards or downwards if the situation warrants it.

5. Action Planning

In this step, an effort is made to lay out the route we are to follow in order to ensure the successful accomplishment of the

plan.

Basically, the Action plan attempts to spell out a number of things:

1. What is the objective/target?
2. Waht actions need to be taken to accomplish it.
3. How much is each action going to cost?
4. Who is going to be accountable?
5. How is implementation going to be monitored?

One of the ways of making an action plan is through the use of a chart with columns for objectives/targets, actions to be taken, accountable person, monitoring indicators and deadlines. (see chart).

In the 1st column objectives are stated clearly and if possible in measurable quantities.
The 2nd column spells out what different action the best and most economical actions are the one listed. Must be arrived at after through discussion with all staff.

The 3rd one is the accountability column shows who is responsible for which action/activity. the 4th column is concerned with monitoring, how are we going to know if progress towards achieving the objective is as expected? What actions should have occured by what dates?. The final column features important deadlines i.e. crucial dates for individual actions' completion.

6. Writing the Plan

Putting the plan into writing is important because it serves

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as a reference document' to remind everyone of what was agreed upon. It is also handy communication tool between the Library and Information Section and other Departments of the Parent Organization.

While the written plan should contain all the important details it should bot be too lengthy. Essentially, the plan should be made up of the following parts:

(a)   A Title page: this should carry the Title and of parent body, the name of the Library/Information centre, the years covered by the plan, and date. The layout should be neat and eye-catching.

(b)   Backgound: This section should briefly give the history of parent body and its Information section, and dominant problems/and factors within which the parent body and its information section exists. Also a brief review of the Parents body's Plan if one exists.

(c)   Reviewing of Previous Plan: This section should briefly evaluate the performance of the library stated in the previous plan. It should highlight objectives which should have been fulfilled, costs incurred, and the rate of success of failure. It should have adequate statistics, tables, and lay the foundation of the future plans.

(d)   Proposals for the new paln: based on the evidence of

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the previous plan, this section should briefly review
the existing situation within which the library is
operating, and identify major areas of growth
expected during the plan period. The objectives
which should guide the new plan should be stated,
with brief explanations, and new areas of operations
identified. The resources which will be required in
the implementation of the plan should be indicated -
i.e. personal, finance, equipment and premises, and
running costs.

Summary

This section has attempted to highlight the basic cncepts and
practice of library planning. Library planning is probably the
single most importatnt factor which can speedGup library
development in out countries. Although it may look
complicated, we shoul;d remember that the best way of learning
how to swim is to get into the water!! likewise, the best way
of learning how to plan for our library development, is by
learning how to plan for our library development, is by doing
it. Remeber, a bad plan is better than no plan at all.

References
McMahon, R., On being in charge. Geneva, WHO, 1980.
Broadbent, K., Management of Information Centres in China:
    Results a course held in Kumning, Yunan Province, PRC,
    6 - 18 Dec. 1982 ed. by K Broadbent. Ottawa: IDRC,
    1984.
Parker, Stephen., Aspects of Library development planning ed.
by S.J. Parker. London: Mansell, 1983.

2. INFORMATION NEEDS ASSESSMENT

LEARNING OBJECTIVES

After sudying and discussing materials presented in this sub-
section a participant should be able to:

1.   Identify   factors   which   determine   the   information
requirements   of a user.

2. Be aware of the methods which can be used to find user
    information needs.

3. State why it is important in a Library/Informatio Unit to
    have periodic/frequent user needs assessment.

3. INFORMATION NEEDS ASSESSMENT

Information needs assessment refers to the deliberate action
to   find   out   users   real   information   requirements   at   a
particular time.   This is extremely important because staff in
information centres are often unaware of dificiencies in their
services   unless   user   needs   assessment   aims   at   establishing
what information is useful to users, what barriers users face
in   using   existing   information   systems,   and   such   findings
become the foundation for designing an appropriate information
provision system.

Determinants of Useful Information:

It is important to realise that in assessing information needs, this had to stufy an individual within a number of contexts. ie. the individual is not in a vacuum. These influential/determining relationships need to be clarified as part of the information needs assessment exercise. these situational factors include:

(a) Characteristics of the individual:
The users level of education, his readiness to seek information (information conciousness), his attitude, and cultural norms are all important elelments in providing a profile of an individual.

The users readiness to use information or his information conciousness is partly the result of: awareness of the usefulness/necessity for using information to maintain professional efficiency and update ones knowledge.
User familiarity and understanding of how/where to search for information, concern for collecting sufficient evidience before reaching a decision, and a motivation to excel in ones work.

b) The work content of the information seeker:
    The work context becomes important in situations where information required is job-related.
    in analysing the various steps or tasks an individual has to do, the information content embedded in each task can be identified. For example, by analysing a syllabus in a College or University, an information unit candevelop an exact picture of the information requirements of students at different levels.

Decision making is an important task in the working context of user. What are the decisons which a person is constantly

called upon to make? The decisions maker reqquires to be able to compare several versions of possible solutions, have access to past, present and future data on a proble, and if possible cases of how use of such data has helped in broadly similar situations.

Research is another important task in a working context. Although research activities are varied, in many cases researchers work in the frontier of knowledge, hence the need for up to date sources of information of their colleagues working in the same specialities throughout the world, before a research is began (literature review) but also a current awareness service during the time they are doing their research.

Administration is another common type of work often encountered; it is concerned with matters of personnel, supervison, planning, and management.

(c) Type of Organization:

The objectives of the parent organization is a particular section will also heavity influence user information requirements, and of course the willingness of the parent institution to invest in information resources. Basically we have profit oriented institutions service, institutions, civil service departments, Parastatals, Non-Government Organizations, production firms, to mention just a few.

Research and training Institutions:

This type of organization aims at: educating personnel in a specific sector (Agriculture, Engineering, Health, etc.) creating new fields of knowledge; and transferring existing

information from one level of application to another.

Organizations under this category do not aim at making profits but at conveying knowledge, and training people to convey information in a specific field (e.g. Agricuture extension Officers). They are thus highly motivates and are willing to accord more substantial budgets to information supply than business organisations.

Academic institutions such as Universities, Colleges of higher education, Secondary Schools would all be classified under this category. Their major concern is with the transmission of knowledge/infomation and the motivation to create and maintain information facilities is extremely high.

Industrial Production Organizations:

Most of these are business organizations which aim at achieving high sales and earning profits and they are business minded as opposed to 'service minded'. Although previous researches on 'information needs' have shopwn that such organizations are major consumers of information - for example - information on procedures, standards, equipment, marketing information - the budgets they are willing to devote in information services remain quite low because of their objective of wanting to cut down costs.

In most cases business and commercial orzations become faithful users of information services offered to them through a Public Library but they are seldom willing to invest on such services on their own.
Government Ministries and Public Administration Organs:
The civil service aims at administering a country/or Department and formulating national policies on various

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matters of Education, Agriculture, Health, defence etc.
The information needs within such organizations is quite
substancial but are partly satisfied through files in the
Registry Section and archives.   The Civil Service often
operates on the principle of precedence i.e. how was a
particular problem hndled before, and this attitude of inertia

constitutes one of the major barriers for using new
information for usrs working in these organizations. It is
also a fact that a substancial number of the information needs
within a civil service dept can be answered by use of General
orders or standing orders.

However, within most Civil Service departments there are
experts or technocrats working there; e.g. Economists,
Engineers, Planners etc. It is probably this category whose
need for information cannot be met from internally gwenerated
sources who need an information facility to transfer new
information into the organization which will enableGthe
experts to be in touch with other experts throughout the
world.

It is often the case also that in a Civil Service bureaucracy,
the lower down an individual is the less information she/he is
likely to get, sinmply because the largest proportion of
information entering an or near the top and then it filters
down following the lines of Authority.

(d) National Context:

The information environment in a given country is determined
by the political economic social cultural, and geographical
situation.   Also the information policy and the level of
development of the Information sector in the country.

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Information needs satisfaction will depend on how supportive
or unsupportive the information inviroment is, for example, if
there is an acute shortage of foreign exchange, it will be
difficult to buy new information from abroad.   If the
political situation is unstable of civil war, or as in South
Africa, based on racial segregation with most of   the
investment being reserved for the Boers, it will be extremely
difficult to develop satisfactory information facilties for
the Black population.

The countrys' level of development is also an important
consideration because this will be closely reflected in the
way the publishing sector operates, levels of education &
literacy the industrial and commercial sector's development
etc. The countrys' level of development will determine the
variety of information sought and also its capacity to satisfy
some of the information needs from within.

(e) Method of Finding User Information Needs:

There are a number of methods which can be employed to find
out user needs, such methods can be rudely grouped into twoR
. Direct methods - are those which rely on querying observing
the user to establish his information needs.
. Indirect methods - are those which rely on sifting and
analysing evidence left behind after use of information
facilities etc.

Direct methods, which are increasing in a popularity though
not yet as popular as indirect one, are often equated with the
term user surveys.   Although this shows the central place of
user surveys in direct methods of assessing user needs its not
quite accurate because there are other techniques one can use.
The main techniques to be used include:

- Questionnaires
- Interviews
- Participant-observation
- User Panels
- Seminar

Questionnaires - consist of a set of questions which have been carefully constructed so that in filling them out the repondent provides the requires information.

There are a number of principles which must be followed if this technique is to provide reliable data: First the selection of respondents has to ensure that they are representative of the total popuation being investigated, normally this achieved by minimising biased respondents through random selection of repondents.

Three types of questions can feature in the questionnaire
(a) closed questions which call for a NO/YES reponse.

    e.g Do you read a newspaper at least once a week?

            YES

            NO

            SOMETIMES

(b) Guided questions in which several pre-determined answers are possible, but the respondent is expected to fill only one out of the several possibilities.

    How much time do you spend in the documentation centre per week?

    0 none

    0 less than 1

    0 1 to 2 hours

    0 3 to 5 hours

    0 more than 5 hours

Both (a) and (b) questOons are easy to codify, precise, but
have limited scope for the respondent to add useful insights
which have not bee" provided for in advance.

(c) Open ended questions aim to provide the respondent with
    ample space to repond to the question, and then an attempt
    is made to codify the responses.
    e.g. When was your last visit to the library and what were
             y o u   l o o k i n g   f o r ?
    _____

    _____

    Can yield very valuable insights but may have problems to
    analyse and codify.

It is now common in most questionnaires tob find a combination
of guided/closed and open questions together.
A problem of low response may be encountered if the
questionnaires are administered by Post. The partial solution
to the problem of low response, delays, is to send
questionnaires for the 2nd time, possibly with a pre-paid
envelope.

Interviewing

Interviewing means a face to face exchange between the
researcher and user to establish the latters information
needs. Normally, in order to have consistency between one
interview and another the researcher has to use a pre-prepared

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set of questions which is basically a questionnaire administered orally.

The two main problems with interviews are: high costs of administering them, and interviewer bias. The advantages include - high response rate, no danger of misinterpreation of questions, and flexiblility.

Observation

Refers to a situation where the researcher observes, unobtrusively the information gathering habits of users; and recording what is considered to be relevant. This can be a useful method, if only because it heightens the awareness of information workers to what is going on around them. However, there are frequent problems in interpreting collected information. For example, is a user standing infront of the catalogue and looking perplexed unsure of how to use the card catalogue, or waiting for someone inside the toilet to solve an urgent bodily function?

Participant observation refers to a situation where a researcher is actively participating in the group he is investigating thus able to get an insight into the internal workings of the group.

Both user Panels and seminar/discussions refer to ongoing techniques of monitoring reactions from users concerninfg their level of satisfaction with services rendered, hence they are mainly follow-up strategies. Individual in the user panels may be requested to provide written reports, or attend meetings where their reactions can be discussed and recorded.

Community Analysis

The Community Analusis techniques refers to a situation where
the researcher profiles the total community in order to
establish its information needs and existing information
environment. It is believed that this renewal of
professional/user relationship should be continuous and there
should be a set of procedures for continual community
monitoring. According to Greer and Hale (1982) "Community

Analysis os a systematic process of collecting, organizing and
analyzing data about the library and its environemnt" (p.358).
The first step in a community analysis exercise is to define
the geogrphic area to be studies; such an area will be
determined by where the actual and potential users of a
service live.

Types of Data Required

(a) Population Figures

What is the total population? What is the potential user
population? What is the percentage using the library at
present? What are the characterisitics of non users? What
are the reasons for non users? How many people in the
different age groups populated the community? Census data is
a sources of useful i*nformation in community analysis eg. the
number of children can give an idea of the potential audience
for children" story hours. Similarly the number of Secondary
School students can indicate how much the service for this age
group need to be expanded.

(b) Employment and other Activities

What are the main occupations in the community, industries and businesses, and other commercial activities, agricultural undertakings? What information is required to carry ut these activities completely? How do the concerned people obtain their information at the moment?

(c) Association, Groups and Societies

What are the various Associations and groups in the community? Where do they meet and what things do they discuss? Is there a directory for such Associations? How can the library include: Literacy groups, the disadvantaged, sports groups etc.

(d) Government Agencies, Parastatals and Departments:

What are the different agencies in the community? What is their work, how do they make their informatibn evailbale to the community? e.g. Banks, Insurance, credit societies, social welfare (ALDEP, ARAP) Adult Education Institutions, etc.

The Public Library should offer information to these Agencies/Departments but also ask them to use the library to dissemminate their own information. This could include arranging public lectures for officials from these agencieis to explain their activities and answering questions form the public in the Library.

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<u>Indirect Methods of Information Needs Assessment</u>:

The techniques which are grouped under this heading can be called indirect because they do nor approach the users directly to find out their information needs but rely on following techniques:

(a) statistics

Many information services have traditionally kept statistics on readers e.g. membership, issue statistics, requests, etc. The main useful of such statistics is that if kept over a long time span, they can reveal trends in information provision for example whether demand is decresing, incresing, or stable. Aslo can be analysed to show the background of registered members, where they come from etc. However, such data does not reveal why effective utilization occurs i.e. it doesn't necessarily mean becausg a person is recorded to have borrowed an item he also found it relevant or that in future she will borrow the same item again.

(Diary- Users may be asked to keep a record concerning infromation used, problems encountered, level of satisfaction etc.

Ideally this should be along term record but is may prove too demanding on the users time and the reader may lose motivation - interest to keep the diary.

Summary:

It is hoped that his brief discussion has shown the impotance of carrying out information needs assessment. The objective of this exercise should: to establish what information is required, information seeking habits, and the barriers users face in using exisiting information services.

There is need to carry out such an assessment at least once every three years in order to have up-to-date records concerning our users.

REFERENCES

1. Greer, C. and Hale, M. The Community Analysis Process in Public Librianship; A Reader edited by Robbins Carter, J. Littleton; Libraries Unlimited, 1982 p. 358 - 366.
2. Cronenberger, R. and Luck, C. Analyzing Community Human Information Needs Information Needs. A Case Study in Library   Treds, January 1976.
3. Palmour, Vernon and Others. A planning Process for Public Libraries, Chicago: American Library Association, 1980.

4. TIME MANAGEMENT

LEARNING OBJECTIVES

After Studying this chapter, its handouts and perfoming the exercises accompanying the course participant should be able to:

1. understand the concept of time as a perishable resource.
2. Investigatehis/her use of time and use of time by other staff members.
3. Plan an effective use of time time according to the work to be i.e.
4. Make work distribution lists for a day, arrange time-tables and duty vosters.
5. Prepare an annual planner.
6. Offer suggestion onm improving time management.

Time has been referred to by Michael West in his novel for children entitled 'The Time Machine' as the fourth dimension. I think this puts emphasis on the fact that although time is invisible it is one of the most omnipresent realities of modern life.

Nowhere is time more invisible than in our own African

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culture. Traditonally time reckoning has been accounted for by the lengthening of the shadow in the countyard; and by the cockrels calls and perhaps this was Madequate in Africa's rural life whre time seemed to move very slowly because it was managed in terms of seasons, and on the short term in relation to taking out livestock to pasture.

Today, however, we are in the middle of a very repidly changing society, and time is always scarce, and of course perishable (i.e. non-renweable). we have to know how to organize and arrange the use of this perishable resources so that the time we have can be used for maximum performance. In other words, we have to avoid the Parkinsons law, which states that, 'Work expand so as to fill the time for its completion'. This discussion will foccs on the following aspects of time management:

1. Maximising performance within limited time.
2. Assessment of time use.
3. Preparation of programme charts.
4. Improvements in time management.

Maximising Performance

There are a number things one can do/avoid doing in order to save time. A commonly used technique is by using machines to handle routine tasks e.g. computers, calsulators. One can also use short cuts e.g. telephone instead of travelling to a place, use of form letters instead of drafting a fresh letter for each routine query.

However, a more systematic approach would involve the

following procedures:

1.   Work out a work distribution list (WDC):   By keeping a
daily diary for a week or so it is possible to find out what
you have been doing.   This is done by listing down the various
activities you perform, record how long you normally take for
each one at the end of the week you will have a work
distribution chart (fig.) below.

Activity	Time	Duration
Travelling		
Reading Newspaper		
Answering telephone		
Telephoning out		
Responding to User queries		
Writing Overdues		
Writing letters		
Tea breaks		
Shelving		
Lunch		
Talking to fellow workers		
Processing materials		
Meetings		

2.   **Analysis of WC**

The second step is to analyse the WDC to find out (a) what
you are actually doing (b) the proportion of time spent on
various activities (c) the importance of the 'individual'
actions in relation to the time you invest in them.   In
analysing the WDC pay particular attention to the
following checklist:

- interruptions
- inessential chores
- tasks which could be delegated
- wasting others time
- others wasting your time
- Am I spending *too long on this task?*
- Am I spending too little time on this task?
- What would have happened if I handn't done this task?
- Am I failing to do certain important tasks which would contribute more to my institutions development because of lack of time?

Step 3: Rationalization of Activities and routines

In this step an attempt is made to do a number of things.
- eliminated time watage by isolating activities which consume more time than they are worth.
- prioty tasks are idlntified and allocated deserved time.
- missed tasks which are important but have not featured in the WC are slotted in daily routines i.e. housekeeping chores which must be carried out continuously are also identified and time set aside for their execution. This is important because future efficiency may be jeopardised by current neglect.

The final product out of step 3 is the preparation of the daily activities done for a particular day bearing in mind the time that each of the activities will take. Each day, first in the morning one should spend a few minutes foing over the previous days list so that any uncompleted activities are transferred to the present days list.

The different jobs could be ranked in order of importance/urgency e.g. some tasks being ranked must be done

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today while others are ranked may be done if time permits.

Programme Charts and Schedules:

A programme is a plan which outlines a number of events intended to take place in future. The key ingrideints of a programme include:

What will be done?

Where it will take place?

Who will do it

When will it occur?

Schedules on the other hand, refer to the organizations of activities which keep on re-occuring e.g. shelving writing reminders, checking overdues, paying monthly subscriptions etc. On the next page is a possible time-table for a small branch library which serves to inform both users and Library Staff what events are scheduled to take place at different times throughout the week.

Weekly Time Table Library

Time/Day	Monday	Tuesday	Wednesday	Thursday	Friday
7.30	Shelving	shelving	Shelving	Shelving	Shelving
	Issue	Issue-	Issue	Issue-	Issue
	Recording	Recording	Recording	Recording	Recording
9.00	Serving-	Serving-	Serving-	Serving-	Serving
	Users	Users	Users	Users	users
10.00	B	R	E	A	K
11.00	User-	User-	User-	User-	User-
	Services	Services	Services	Services	
12.00	L	U	N	C	H
2.00	User-	New-		New	
	Services	Members		members	
		Introduction		Introduction	
		Overdue		Overdue	
4.00	Lecture/	Film	Children	Film	Children

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club-activities	story-hour	story-hr

Step 4: <u>Preparing an Annual Calendar/Annual Planner</u>

A daily programme of action or a weekly one are very useful tooks for efficient time management. It is also very helpful to be alsobe to see the whole year at once and see the distribution of major events throughout the year at onve and see the distribution of major events throughout the year. There is no better way of doing major events marked. Such events may include: Annual stock taking subscriptions renewal, budget estimates, quaterly and Annual reports, annual festivals, conferences and seminars, elections, closing and opening dates for schools, examination dates etc.

The annual Planner is useful because (1) it reminds us of events which are going to take place, (2) shows where we can fit new events such as displays of materials, or seminars (3) allows us to prepare adequately for those events outside out control. These events which are known in advance should be provided for in the Annual Planner so that they become routine rather than crisises.

An annual planner can be made simply by taking a manila sheet of paper drawing thirty-one lines, down, and 12 columns across the sheet, one for each month. All the events to be noted can be entered at the right place. It is possible tp buy published annual planners at sone bookshops.

Hints for Improving Time Management.

. Avoid grasshoping - try not to jump from one thing ti another, do not do too many things at the same tine, as much as it is possile concentrate on one thing at a time. Avoid panic. Try to arrange your work 'logically or sequentially as much as possible.

. Avoid too much socialising at the expense of your work e.g.
spending too much time with visitors, talking for too long
with   fellow workers, spending too much time telephoning,
spending   too much time in the tea-room etc.
. Improve your time management through: Keeping a diary of
appointments, daily actions lists, seeking appointments before
 you visit another person, developing an annual planner.
. Respect for time - As pointed out at the beginning of this
discussion time is a perishable non-renewabkle resources.
When we have an appointment, we need to keep time and insist
the   same from other. In addition, we should make realistic
estimates of how long particular job will take and stick to
the time standard which we have set. However, respect for
time is not meant to turn us into robots, regular breaks and
short rest pauses are important in reducing pressure of work
and increasing work efficiency.
. Premium time - Normally, in the morning hours we are fresh
and at maximum alertness hence this is our highly productive,
time and mentally demanding tasks should be tackled at his
premium time, while less demanding tasks can be allocated
afternoon hourse when are sluggish and less productive.
. Being organised is quite important especially when working
under pressure, if one is disorganised, it means no prior
planning for events has been done, no records of
appoinments/commitments is kept hence leading to overcrowded
shedules, often accepting things without a clear idea of the
time commitment involved. More often than not this leads to
what has been called 'crisis management.'

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REFERENCES

1. St, Clair, Guy Managing the one person library, London:
   Butterworths, 1986 ch 8.
2. Welsh, A.N. The skills of Management. Adershot: Gower,
1980 ch 2.
3. Library Management in Review edited by Bruemmer A, Reed,
 A, Quinn, K. Special Libraries ASS: New York, 1981,
    p.32-48.

EXERCISES

1. Self assessment of use of time on non-work activities per
    average day. (calculate average time spent on the
    following:).
    (a)   coffee breaks, (b) late arrival, (c) relaxing in
staff room, (d) personal phone calls, (e) early departure
from work, (f) extended lunch etc.
2.   Make a personal year plan for yourself on a sheet of
paper.
    (Use important personal or fami;y events for yourself e.g.
    birthdays, leave, pay-days etc.)
3.   Make an Annual Planner for Library/Information Unit you
are familiar with.

5. SELF MANAGEMENT

    LEARNING OBJECTIVES
After studying this sub-section and performing the exercises
at the end of the course the participant should be able to:
1.   Identify the behaviour pattern which leads to better self
     management.
2.   Improve hi/her self-management by use of the outline
     techniques.

Traditionally, Management has been defined as 'accomplishing'
gaols through other people' which sounds every bit like
manipulation of other human beings for the Manager's benefit.
traditonal Management has been expanded to include management
of resources eg. Financial Management, Transport management
etc.   Few, if any, textbooks discuss how to manage yourself.
Few Managers and those in supervisory positions seem to
realise how vital it is to manage themselves as completently
as they profess to manage subordinates.

A cut and dry definition of self management is unfortunately
still elusive, but for the purpose of this discussion this
mouthful will do.   it involves the individial planning and
acting conciously, in a way which permits maximum performance
in the attainment of goals and objectives at both individual
and institutional levels.

Self Management is charactrised by the following behaviour

patterns:

. Involves the individual in viewing his position/actions objectivesly e.g by asking: What am I supposed to accomplish? The objective of such self questioning of one's role is to obtain results rather than just labouring on routines or traditonal chores.

. Cultivating the habit of cross examining yourself and your actions in order to reach 'true and honest' conclusions about what you have just done.
For example, when something you were doing has failed to turn out the way it was intended you should ask yourself:
What did I wrong? Why? What would I do differently if I had to so it all over again? How can I ensure that the mistakes/short falls of this time do not re occur next time? How can I improve performance?

The underlying motivation of all self questioning is to derive maximum benefit from experience by sifting what ever valuable lessons abnd incoporating them ito your stock of experience.
Developing 'structures' or mechanisms for enchancing your performance e.g. setting of prioritioes, keeping a diary of appointments, listing of your daily activities every morning, managing your time properly etc. It would be difficult to manage yourself successfully without first creating the 'structures' which can play an enabling role and assist you to perform at peak level.

. Modify youzr behaviour to make yourself more achieving/more productive. This calls for a high degree of will power and self descipline to enbale you to gradually shed off negative habits and cultivate habits and behaviours which enable you tp be more productive and more successful in your work. Such change of behaviour might call for seeing less of certain

people who are always associated with certain unproductive consequences e.g. too much talking, too much boozing etc.

But how can one 'functionalize' self management? Self Management can be implemented through the use of following three techniques:

1. Thinking management.

2. Managing personal feelings.

3. Personal organization.

Thinking Management:

Thinking is the basis upon which human actions are based, and often reference has been made to the human being as the 'thinking' animal. The key attitude to managing our thinking is 'to keep and open mind' on problems which confront us by not jumping to conlusions too fast until we have gathered all the facts concerning the problem we face,. The second requirement is to look at both the negative and positive side of things rather than being influences by just one side of the picture.

Take the example of a situation where 2 workers come to you and report that another worker is stealing books from the library. This is an outrageous act but steps should be taken against the accused only after a thorough investigation, icluding getting his point of view on the charge.

It is perhaps clear by now that a valuable attitude of mind which will aid us our thinking is to avoid being dogmatic and being too full of our own self-importance. Even when we are almost certain we are correct, we should be prepared/to and infact encourage others to speak, and listen to their views and incorporate any useful ideas into the main stream of our thinking.

A cautionary note here is necessary. Keeping an open mind, and accepting ideas from users, colleagues etc should not imply that we abandon our own ideas completely and swing like a pendulum from one idea to another everytime we come into contact with a different idea from those we communicate with. Another important technique is to think through any action which we are about to udertake however simple it may be; thinking we should try to forsee the differennt logical steps which need to be taken, the consequences of each step, alternative approaches, and the outcome or product of our efforts. This will help us to decide the best way a particular action can be undertaken.

For example, if you need to talk to someone 2 strees away, it doesn't necessarily mean you have to walk there. You should think whether you can do it by; telephoning? Writing a message and sending someone? Dropping in to see the person on your way back from another appoinment? Thinking, therefore, must precede all our actions and we hace to budget time for thinking before we take action. However, thinking alone cannot make things happen, hence it should not take the place of action. Day dreaming is great time water for many individual.

The professional education which we have in our area of competence remains the framework within which our thinking takes place because it provided us with a specific philosophy on how to look upon our environment.

Managing Personal Feelings: It has often been said that a human being has two sides, the rational man had the emotional man. Emotions such as: anger, love, hate, shame, humiliation, shock are an important part of our humanity. In the world of

professional practice, we would not like emotions to replace reasoning because decisions taken under such conditions are unreliable and poor. For example, out feelings may interfere with our judgement in favouring one person who appeals to us but penalise another who is better our personalities do not match. This can be very costly to the organization when we are interviewing new employees.

It is important therefore, to guard against emotions when dealing with people; users, fellow workers and bosseIt is not easy to pinpoint the numerous occassions when our emotions may come between our rational side and rational decisons. Examples of events which may trigger an emotional state of mind include personal frustrations, set-backs unhapiness, anger, humiliation, feelings of insecurrity, love etc.

There are many examples of irrational decisons which we may make when we are emotional, eg. covering up mistakes which have been committed and hope things will remain covered for ever; lying in order to defend ourselves against criticism, treating others unfairly because of imagined things they are supposed to have done to us etc.

Ideally, the thing to do is to probe our actions and if we detect that a decision we made was unduly influenced by our 'feelings' rather than better judgement to repair what ever judgement to repair what ever damage might have been done by modifying/changing the former decision.

Backward Review

Literally it means the technique of regularly reviewing events which you have just finished in order to provide with

additional insights about yourself, how you behaved, why and develop further your powers of decision making.

In addition, the backward enables you to loook into thethin which you are operating to see how best you can interract with these conditions including a further clarification of which are the favourable and unfavourable factors. This helps very much in planning your actions and modifying your plan of action.

The technique of looking into our own actions and evaluating them enables us o learn from the our setbacks and make sense of our shortfalls which is an important foundation for our self_development and growth in professional practice. Leraning from our mistakes and benefiting from experience/learning capacity is the objective of backward review.

Personal Organisation:

Personal organisation refers to how the individual establishes contorl over the activities which he/she is expected to do so that the operations are tackled in the best possible way.

Personal organisation can be established using 3 distinct steps: the first step is Analysis and Priotization of tasks. The second step is creating a list of Actions in relation to the time_frame. The third step is Timing of Activities. Now let us look at each step in some brief detail.

Step 1: Analysis and Prioritization of Tasks

This is composed of asking yourself questions like: what has my parent organisation been established to do? What

contributions can the Lib/Inf centre make to achieve these goals? What should oue key operational areas be? which should be our immediate action in order to achieve those 'key' objectives?

This analysis will hopefully enable us to identify our 'priority task' in which we should invest our time and efforts. Similarly we shall identify the 'routine' task which must be carried out on a continuous basis if we are to acomplish the priority or key tasks.

Step 2: Creating a List of Activities

This is a list which we have to make each morning (if possible) or each week showing what we intend to accomplish in that period. If the list is made daily the porcedure is to list all things which are required to be done for the day. This is usually done first thing in the morning; we should start by looking at the previous days list and carry forward any tasks which could not be done because of lack of time. In the course of the day items which have been done are ticked as they are acted upon.

There should be provision for the 'unexpected' which crops up in the because of the demands from the users, bosses or colleagues but on the whole the list of activities should be a respected guide to uor actions. There is need to avoid lists of 'routines' only which lack in 'forward steps' and lists which are reactive but not pro_active.

Step 3: Timing of Activities:

This refers to the fact that one needs to develop an implementation schedule aimed at fitting the actions into a

suitable time frame eg. working out how much time a particular
activity will consume and making sure that adequate time has
been set aside for it. Equaly important is to decide when is
the optimum time for carrying out a particular task in order
to have desired results eg. budget preparation etc.

In so far as it is possible, we must have an Annual Planner in
the form of a Wall Chart and a Diary for recording daily
activities and future commitments. The annual Planner should
show all those activities which must take place at a certain
time of the year regularly (date of starting and date of
completion) so as to guide us in our actions. Good examples in
Lib/Inf centres include:
. Annual renewal of subscriptions.
. End of Academic Year recall of mterials in Educational
  Libraries.
  . Stocktaking exercises
  . Annual exhibitions of materials to coincide with
important national events.
    . Staff Perormance reviews.
    . Quarterly and Annual reports etc.

Group Discussion

Discuss the concept of SM and its tehniques, isolate the part
which can be used to improve your performance and show the
parts which are not applicable in your situation.

REFERENCES

1. St. Clair, Guy. Managing the one person Library. London: Butterworths, 1986.
2. Welsh, A.N. The Skills of Management. Aldershot: Gower, 1980.

6. TECHNIQUES OF HOW TO MANAGE SUPERIORS AND COMMITTEES
LEARNING OBJECTIVES
After studying this chapter, and performing the accompanying
exercises the course participant should be able to:
1. Establish the main characteristics of his/her
   superior officer and the character of any supervisory
   body eg. Library committee, library Board etc.
2. Master the basic tehniques of managing superiors and
   supervisory/advisory committees.
3. Identify the do's and the don'ts in boss management.

In most textbooks management is defined as 'accomplishing
goals through other people'. Management has beeen
traditionally concerned with controlling surbordinates, and
according to Peter Drucker this oncern is not only
restrictive, but 50 years out of date. Drucker defines a
manager as 'someone who is responsible for the performance
of all those whom his/her own performance depends ...'
Drucker, (1986). If we are to accept this fluid definition,
management has to concern itself with the chain of bosses
above us, and the Library committee or Library Board to
which we may be required to report and justify our actions
and plans in the Library information centre.

There are a number of reasons why we must learn to manage our
superiors, one is that for our self-development in the
organisation to proceed unhampered we have to work closely
with our boss. Secondly, for our Library-section plans to
succeed we have to work through the boss because s/he is the

communication link between ourselves and the higher echelons of the organisation. Quite often, the boss represents our section in senior staff meetings which may not be entitled to attend, therefore, it is to our interest if s/he understands everything we are striving to do, and is motivated to present and defend oue interests. Third, boss management is useful in reducing subordinate_superior conflict and tensions in the organisation, complaining about the boss, cutting of lines of communication as much as possible, avoiding each other in the corridor simply fuels distrusts. An attempt to manage the boss, however, radically changes the interpersonal relationships because the junior officer is actively engaged in controlling and shaping events to suit his/her 'interests'.

The key approach to managing the boss is to take the trouble to understand him/her. The boss is human being and not a God. We should know that in the organisation the boss spends a good amount of time studying subordinates (including you). There is no harm if you also find out a number of things about your boss, for example:
        . what the things the boss does very well and succesfully?
        . what are the things the boss does not do very well?

The answers to these two crucial questions will enable you to plan your boss management strategy aong the lines: How can I help my boss in his/her weak areas? (i.e. safeguard and strengthen the boss). Also how can I derive maximum benefit from the areas of strength?

The boss is a human being, who has family and other problems like the rest of us. Without spying on the boss, we should try to find out what family or other porblems he may have, often this may explain why s/he is harsh, and difficult to get on

with at work. Knowing such background factors will allow us to accommodate easily the negative treatment from the boss, while if we don't know anything, it simply makes us insecure, frustrated and demoralised. In addition, we can try to ofer the boss whatever emotional support we can give to help him/her get overthe setback. At a parctical level, we can try to give him/her assistance by suggesting that if there isany extra piece of work he should like us to follow up on his/her behalf we would be quite happy to do so.

It is equally important to study our boss to find his level of tolerance to criticism and differences of opinion. There are some bossea who can't stand public criticism, but will accept it in a private discussion. Others can't accept it face to face, but will not react too adversely if it is put down in writing and forwarded as internal memorandum. Others are too touchy on certain issues but reasonable on others. After studyng the boss for some time, we should be able to have an accurate profile of areas where s/he is very sensitive, and those which he is not too touchy and formulate our strategy of tackling.

In Africa we hav to understand that the boss_junior relationship is a more hierarchical one than in most places, bosses demand and expect respect, unquestioned loyalty, and obedience from subordinates. Communicating with the boss is a very important aspect of ceating a relationship of trust and gaining his/her support. We should take the initiative in keeping te lines of communication open, keeping the boss fully informed about or actions, including problems we have to face or are anticipating. If we intend raising a serious issue in meeting, s/he should be informed beforehand. If our boss is a non_Librarian, our; langage should be simply, straightforward and free from jargon. Ideally things should be

explained or discussed vebally first, and then put in writing for follow_up purposes.

The munber of dont,s in the boss management include:
- Never humilaite the boss (especially in public)
- Never underrate the boss.

- Never backbite the boss to other staff because they may go and tell him/her.
- Never cheat/mislead the boss as s/he may lose his/her confidence in you in future.
- Never repeat what you aretold in confidence to others.

The munber of do's inclue the following:
- Create a relationship of trust.
- Respect (not fear) your boss.
- Carry ut orders diligently and to do the best of your ability.
- Protect your boss whenever there is need to do so.
- make a hobby of studyng your boss and knowing him/her well.

Library Committee/Library Board

Working effectively with Library Committees/Boards means that the Librarian must manage them inorder to achieve the objectives of the Library. There are many similarities between the techniques of of boss management discussed above, and the techniques of managing Library committees. One obvious area is that in both cases you are acting from a position of weakness rather than institutional strength. You are required in both cases to manage without appearing to do so, that is, unobtrusive management.

The main principle is aim to study the nature of your committee,
is it Advisory, Executive, or a Working Committee?
The chairperson of the committee should be the special target of
your efforts. According to St Clair and williamson in their book
'Managing the One Person Library' there should be a close working
relationship between the Librarian and the chairman
of the committee.

> 'Whenever possible, the Librarian should seek the
> opportunity to be useful to the chairman, as well as
> other members of the committee. Infact, some of the
> chairman's work can be simplified when the librarian
> and chairman offer mutual respect and support. One of
> the most effective ways for the Librarian to gain in
> this regard is to seek out the chairmanand ask his or
> her opinion onsubjects for discussion at committee or
> board meetings... to discuss, what areas might call
> for mutual support...? (p.33)

Basically, the librarian and the committee or board can establish
a relationship in which they work as a team, with the Librrian
having the confidence that an active, interested committee 'can
provide the library with meaningful support, sound advice, and
guidance and act as liaison between usrs and management'.

In summary, one can say that the task of managing both our boss,
and the Library committee is as essential as managing our
subordinates. Such a task rquires a different approach but we can
accept that this part of the junior officers responsibility and
an important key to his/her effectiveness.

REFERENCES

1. Drucker, P. managing the Boss in <u>The Wall Street Journal.</u>
   Jan,1986
2. Katayama, Jane, The Library committee: How important is it?
   Special Libraries vol. 24, no. 1, 1983. p.44.
3. St. Clair, G. and Williamson, J. Managing the One-Person
   Library. london: Butterworths, 1986 Chapter 6.