LIS 210
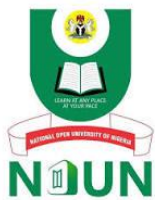**LIBRARY APPLICATION SOFTWARE PACKAGES**

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      Prof. Stephen Osafon Nwaifo (Course Editor) - Delsu

NATIONAL OPEN UNIVERSITY OF NIGERIA

CONTENTS

INTRODUCTION

LIS 210: LIBRARY APPLICATION SOFTWARE PACKAGES 2C LIS 210 Library Application Software Packages is a core course with 2 credit unit which will last for one semester. It is a compulsory course for all undergraduates in the Department of Library and Information Science at the university. It is also suitable courseware for library students who wish to acquire the needed knowledge and skills on Library Application Software Packages and how best to use these application software packages to carrying library activities or operations.

The course examined the definition of concepts; functions of library application software packages; types of library application software packages; basic structures of typical application software packages for library and information work; library application software packages skills and competencies requirements; acquisition and management of library application software packages; application of library software packages to library and information work; hands-on practical sessions on library application software packages in computer laboratory/ libraries and information centres.

COURSE AIMS

This course aims to introduce you to the general knowledge on Library Application Software Packages and how best to use these application software packages in carrying out library activities or operation. These include computer system, library housekeeping operations library application software, competence skills and criteria for selecting integrated library systems. The course consists of four modules with fourteen units of study. In this course, you will also learn the components of a computer, library housekeeping operations such as library automation, retrospective conversion and institutional repositories. You will also learn about Integrated Library System (ILS), Criteria for Selecting Integrated Library System; Skills and Competencies including the current and future trends in the development of Integrated Library Systems

COURSE OBJECTIVES

To achieve the above aims, some course objectives must be considered. Each unit in this study material has specific objectives which will guide you in checking on your progress while you do your study.

By the end of this course you will be able to:
- Identify the Components of a Computer
- Define Library Application Software Packages

- List and explain the Library Housekeeping operations
- Discuss the Library Automation
- Define the term Retrospective Conversion
- Explain the term Institutional Repositories
- Identify and explain the concept of an Integrated Library System
- Identify other core technology competencies that will enable the effective utilization of the Integrated Library System in use
- Identify criteria for selecting the software
- Discuss the criteria for selecting Integrated Library System in use
- Understand the preliminary Steps for Evaluation of Integrated Library System.
- Discuss the parameters for Evaluation of Integrated Library System
- Explain current and future trends in the development of Integrated Library.

WORKING THROUGH THIS COURSE

To complete this course, you have to study the four modules and fourteen study units carefully, do all practical exercises and assessments attached to each unit of study. Read the recommended books and other materials available to you. Always participate in the online facilitation and facilitation going on in your study centre. Each unit of study has an introduction, intended learning outcomes (objectives) you should achieve at the end of the study, a conclusion and summary informing you in a nutshell what you studied in the unit. Above all, there is a self – assessment exercise at the end of every unit to evaluate what you have learnt. You are advised to download the courseware into your device so that you can study it whenever you are offline.

ASSESSMENT

There are two main forms of assessments namely; formative and the summative. The formative assessments are conducted at the end of every unit of study. The formative assessments will enable you to evaluate your learning output. The university uses the summative assessments to evaluate your academic performance in the courseware you studied at the end of each session or semester. The summative assessment is a Computer-Based Test (CBT) made up of objectives and sub-objective questions. There are 3 continuous assessments, 10% each and final examinations are based on 70%. You are required to take all the computer-based tests and the final examination to the final grade for this course.

STUDY UNITS

Module 1   Components of a Computer System

Unit 1   Components of a Computer
Unit 2   Hardware
Unit 3   Software
Unit 4   Software Packages

Module 2   Library Housekeeping Operations

Unit 1   Housekeeping operations
Unit 2   Library Automation
Unit 3   Retrospective Conversion
Unit 4   Institutional Repositories

Module 3   Library Application Software Packages

Unit 1   Library Application Software Packages
Unit 2   Integrated Library System (ILs) and Library Housekeeping
Unit 3   The Integrated Library Systems in Use

Module 4   Competences/Skills and Criteria for Selecting Integrated Library System

Unit 1   Integrated library System Skills and Competences
Unit 2   Criteria for Selecting and Evaluation of Integrated Library Systems
Unit 3   Current and Future trends in the development of Integrated Library Systems

MAIN COURSE

CONTENTS

MODULE 1   COMPONENTS OF A COMPUTER SYSTEM

INTRODUCTION

In this module, the Components of a computer system will be discussed. This will prepare and introduce you to the basic concepts associated with the computer. This prepares students for the application of these concepts in the library.

Unit 1   Components of a Computer
Unit 2   Hardware
Unit 3   Software
Unit 4   Software Packages

UNIT 1   COMPONENTS OF A COMPUTER

Unit Structure

1.0   Introduction
2.0   Intended Learning Outcomes (ILOs)
3.0   Main Content
        3.1   Definition of Computer
        3.2   Functional Units of a Computer
        3.3   Characteristics of a Computer
4.0   Conclusion
5.0   Summary
6.0   Tutor-Marked Assessment
7.0   References/Further Reading

1.0   INTRODUCTION

Welcome to this unit, in this unit you will be introduced to the computer system, the functional units of a computer and the characteristics of a computer. The computer is the platform from which libraries can launch their application software packages.

2.0   INTENDED LEARNING OUTCOMES (ILOs)

By the end of this unit, you will be able to:

- identify a computer system.
- identify the functional units of a computer.
- discuss the major characteristics of a computer.

3.0   MAIN CONTENT

3.1   Definition of Computer

A computer is an electronic device, operating under the control of instructions stored in its memory that can accept data (input), process the data according to specified rules, produce information (output), and store the information for future use. It is also a programmable machine designed to perform arithmetic and logical operations automatically and sequentially on the input given by the user and gives the desired output after processing.

It is an electronic and programmable machine operating under the control of instructions (that are arithmetic and logical operations) stored in its memory, it accepts these instructions as input/data, manipulates these data, and produces the results as output or store them in its memory. A computer is an electronic data processing device, which accepts and stores data input, processes the data input, and generates the output in a required format.

A Computer system is a basic, complete and functional computer, including all the Hardware and Software required to make it functional for a user. It is a set of integrated devices that input, output, process, and store data and information. They are currently built around at least one digital processing device. This device does all the processing of the instructions the system receives from the user. The computer system is made up of **hardware** and **software**. This computer cannot perform their task without the use of the hardware, software systems and **peopleware.** The **peopleware** is a human being who operates the computer to make it perform its functions.

COMPUTER DEVICES AND THEIR TYPES

Devices	Types
Pointing Device	Mouse, touchpad, touch screen, multi-touch screen, pen input, motion sensor, graphics tablet, interactive smartboard, and fingerprint scanner
Game Controller	Joystick, gamepad, and steering wheel.
Audio Input Device	Microphone and midi keyboard.
Bluetooth Peripheral	Keyboard, mouse, headset, gamepad, printer.

Visual and Imaging Device	Webcam, digital camera, digital camcorder, TV capture card, biometric scanner, and barcode reader.
Network Device	Ethernet hardware and Bluetooth/wireless hardware.

3.2   Functional Units of a Computer System

A computer system consists of mainly four basic units; namely input unit, storage unit, central processing unit and output unit. The following are the functional units of the computer system:

1.   Input Unit
2.   Storage Unit
3.   Processing Unit
4.   Output Unit

Source:http://ecomputernotes.com/fundamental/introduction-to-computer/draw-the-block-diagram-of-computer-and-explain-its-various-components
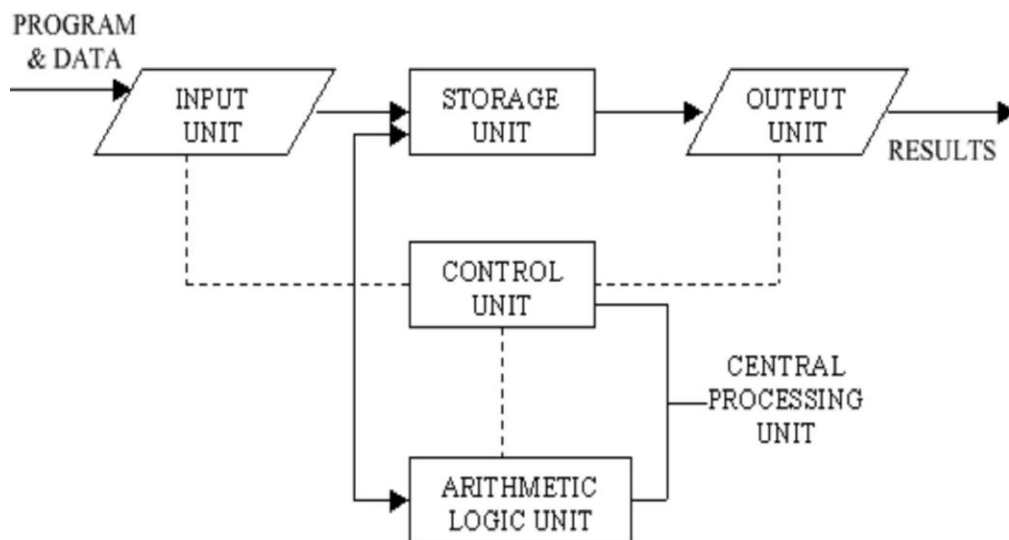
3.2.1 Input Unit

This unit is used for entering data and programs into the computer system by the user for processing. Some of the common input devices include

Computer Keyboard: A computer keyboard looks like a conventional typewriter keyboard but has more keys than the typewriter keyboard. To use the keyboard in inputting data make always rest your fingers on the

keys. The computer keyboard is divided into four parts namely: **function keys, alphanumeric keys, Numeric Keys and Control keys**. The function keys have twelve keys arranged in a row at the top of the keyboard. The F1 to F12 which are used in programs as shortcuts keys in performing the frequent task. The alphanumeric keys in a keyboard contain numbers and alphabets in the keypad. The cursor control keys indicate to you where you are pointing to in any document. The numeric keyboard is divided into five rows namely signs, top, base, middle and bottom.

Mouse: It is a pointer in the computer screen used in navigating or moving around in the computer screen. The mouse is also a cursor control device which appears as a small size palm box. The mouse has two buttons with a wheel in between the two buttons, one on the left hand and one on the right hand.

Microphone: It an input device used in adding sound to a computer system. It captures audio by converting sound waves into an electronic signal. It will help to input audio into your computer system.

Barcode Reader: It is one of the commonly used handheld scanners which is used in libraries for numbering of books and in shopping stores to evaluate goods

Joystick: It an input device used in controlling video games and graphics applications on a computer.

3.2.2 Storage Unit

The storage unit is used for storing data and instructions before and after processing.

3.2.3 Processing Unit

The task of performing operations like arithmetic and logical operations is called processing. The Central Processing Unit (CPU) takes data and instructions from the storage unit and makes all sorts of calculations based on the instructions given and the type of data provided. It is then sent back to the storage unit. The Central Processing Unit (**CPU)** includes Arithmetic logic unit (ALU) and control unit (CU)

- **Arithmetic Logic Unit:** All calculations and comparisons, based on the instructions provided, are carried out within the ALU. It performs arithmetic functions like addition, subtraction, multiplication, division and also logical operations like greater than, less than and equal to etc.

4

- **Control Unit:** Controlling of all operations like input, processing and output are performed by the control unit. It takes care of step by step processing of all operations inside the computer.

3.2.4 Output Unit

This unit is used to send data out of the system.   Some output devices are:

Monitor: It displays images and text on a computer screen for you to read.

Printer: You use the printer to produce a hard copy of the information, images and data stored inside the computer system. Printers are divided into two types Impact and non-impact printers
Speaker: Speaker is an output device in a computer system that produces sound and makes music to be audible to the users.

3.3   Characteristics of a Computer

The following are the characteristics of a computer that makes them very powerful electronic machines.

1. **Speed:** Computer is a very fast and accurate device. Since electronic pulses travel at incredible speed and they are electronic device its internal speed is virtually instantaneous. A microcomputer can process millions of instructions per seconds over and over again without any mistake.

2. **Accuracy:** Computers physical circuits rarely make errors, if the data and instruction are correctly fed. Most errors which occur in computers are either hardware error or human error.

3. **Storage:** Computers have a large amount of memory to hold a very large amount of data, we can store a large amount of data information in the secondary storage device.

4. **Programmability:** A computer is programmable; i. e. what computer does depend on the lines of instruction (Program) it is using.

5. **Diligence:** Computer is free from problems like lack of concentration, and confusions etc. The computer is never confused like humans and it can perform instruction again and again without failing or getting bored.

6.	**Versatility:** We can perform many different types of tasks on a computer, one moment it might be busy in calculating the statistical date for annual performance evaluation of a business organization and next moment it might be working on inventory control.

7.	**Power of remembrance:** Unlike humans, the computer can store things for an unlimited period. It has great remembering power.

## 4.0	CONCLUSION

In this unit, you have learnt the definition of a computer. You have also learnt the functional units of a computer and the characteristics of a computer.

## 5.0	SUMMARY

The functional parts of the computer that you learnt in this unit are input, storage unit, processing unit and the output unit. You also learnt the various functions each unit performs in the processing of data. Finally, you learnt that the major characteristics of a computer are that Computer is a very fast and accurate device, stores a very large amount of data, the computer is never confused etc.

## 6.0	TUTOR-MARKED ASSESSMENT

1.	Define the term computer system?
2.	List the functional units of a computer?
3.	Discuss the major characteristics of a computer?

## 7.0	REFERENCES/FURTHER READING

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UNIT 2   HARDWARE COMPONENTS OF A COMPUTER

CONTENTS

1.0   Introduction
2.0   Intended Learning Outcomes (ILOs)
3.0   Main Content
        3.1   Concept of Hardware
        3.2   Categories of Computer Hardware
        3.3   Peripheral Devices
4.0   Conclusion
5.0   Summary
6.0   Tutor-Marked Assessment
7.0   References/Further Reading

1.0   INTRODUCTION

Welcome to this unit, you have learnt about what a computer is and the components of the computer which included software and hardware components. In this unit, you will be learning what makes up the Hardware components of the computer, the categories of computer hardware and peripheral devices.

2.0   INTENDED LEARNING OUTCOMES (ILOs)

By the end of this unit, you will be able to:

•   define the term hardware.
•   identify the categories of computer hardware.
•   identify peripheral devices that are connected to the computer.

3.0   MAIN CONTENT

3.1   Concept of Hardware

A computer system is an integrated set of hardware and software designed to process data and produces a meaningful result. Every computer performs the basic functions of input, processing, storage, output, and transmission of data. Instructions and data are entered, processed into results that are stored for later use, and output in a useful format. Computers are connected to a larger network system for transmission of data and information.

CATEGORIES OF COMPUTER HARDWARE COMPONENT

SPEAKERS
Used to produce audio output.

MONITOR
An output device that lets you see your work as you go.

CD/DVD DRIVE
Reads CD/DVD discs.

SYSTEM UNIT
The case that contains the CPU, memory, the power supply, disk drives, and all other hardware— such as a modem— that are in an internal format.

PRINTER
Produces printed copies of computer output.

MICROPHONE
Used to get spoken input.

FLOPPY DISKS
Used for storing small amounts of data for backup or to transport data to another PC.

KEYBOARD
The principal input device; used to type instructions into the computer.

CD/DVD DISCS
Commonly used to deliver programs and store large multimedia files.

MOUSE
A pointing device used to make on-screen selections.

FLOPPY DISK DRIVE
Reads from and writes to floppy disks.

HARD DRIVE
Located inside the system unit and used to store programs and most data.

FLASH MEMORY CARD READER
Used to read flash memory cards.

FIGURE 1-7
Typical computer hardware.

The Computer Hardware: Adopted From http://www.bngkolkata.com/web/wpcontent/uploads/2015/08/081615_0 346_TheHardware1.jpg

Computer hardware is organized according to these basic functions. The system unit focuses on processing. Whereas a variety of peripheral devices facilitate input, output, storage, and communication. Computer Hardware also referred to as the machinery or the equipment of the computer, is physical elements of a computer. The hardware components of a computer system are the electronic and mechanical parts.

The major hardware components of a computer system are:
- Processor(CPU)
- Main memory
- Secondary memory
- Input devices
- Output devices

For typical desktop computers, the processor, main memory, secondary memory, power supply, and supporting hardware are housed in a metal case. Many of the components are connected to the main circuit board of the computer, called the motherboard. The power supply supplies power for most of the components. Various input devices (such as the keyboard)

and output devices (such as the monitor) are attached through connectors at the rear of the case.
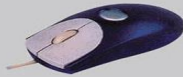
3.2   Computer Hardware Components

These Hardware components are further classified into four distinct categories.
1.   Input devices: For raw data input.
2.   Processing devices: To process raw data instructions into information.
3.   Output devices: To disseminate data and information.
4.   Memory /Storage devices: For data and information retention.

3.2.1 Input Devices

Components which are used to input raw data are categorized under input devices. They aid in feeding data such as text, images, and audiovisual recordings. They even aid in file transfers between computers. The keyboard is probably the most commonly used input device. Other input devices include:

Input Devices of a Computer System

https://ictlounge.com/Images/Manual%20Input%20Devices.gif.

3.2.2 Processing Devices

Processing is the core function of a computer. It is the stage where raw data is transformed into information. Once data has been processed, it can be used for useful purposes. Components that manipulate data into information are categorized under processing. The microprocessor is the major device in this category. It works closely with primary memory during its operations. Data is stored temporarily in processor cache and primary memory during the processing period. The microprocessor is an

electronic device about a one-inch square, covered in plastic. Inside the square is an even smaller square of silicon-containing millions of tiny electrical parts. A microprocessor may contain 100 million transistors. It does the fundamental computing within the system, and directly or indirectly controls all the other components.

Computer Memory is divided into three important units, which work together to accomplish its function. The units are:

- The control unit: It manages and supervises the operations of the processor and other components that are crucial in data manipulation.
- Arithmetic and logic unit: The ALU is responsible for all arithmetic and logic operations like addition, multiplication, subtraction, division, and comparison logic operations.
- Register and cache: These are storage locations inside the processor that respond to the instructions of the control unit by moving relevant data around during processing.

3.2.3 Output Devices

Hardware components that disseminate and display both data and information are classified under the output category. The output is the culmination of a cycle which starts with the input of raw data and processing. An output device is used to send data out of the system. Some output devices are:
1. Monitor,
2. Printer,
3. Speakers.

Output devices are sub-categorized under softcopy and hardcopy output. Softcopy output includes the intangible experience. The user derives visual satisfaction by reading a message through display components or listens to audio files through speakers. On the other hand, hardcopy output devices are tangible, like printouts of paper and 3D models.

3.2.4 Memory/Storage Devices

Components that retain/store data are classified under memory/storage devices. Storage is sub-divided under primary and secondary memory and which also volatile or nonvolatile.

Primary memory usually refers to Random-Access Memory (RAM) but can also refer to all memory that works in tandem with the processor. RAM is volatile, meaning that it retains data only when the computer is powered up. So the primary memory is a volatile storage device because it needs a constant power supply to keep the data and information stored

on them active in the computer system. The central processing unit (CPU) or accelerated processing unit (APU) reads instructions stored in this memory and executes them as required.

Secondary memory is labelled as such because data stored within secondary storage media (usually disk drives) do not communicate directly with the microprocessor. Any data stored in such media is first transferred to a RAM device for processing to take place.

This type of memory is also non-volatile since it permits long time storage as opposed to volatile memory. The examples of Secondary memory are:

Hard drive: the hard drive houses the hard disk. You should not remove the hard disk from the hard drive pack in the computer system because it is an internal storage device with a large capacity for storage in your system.

Solid-State Drive: Stores the files, programs just as the hard disk drive

Universal Serial Bus (USB) drives: Use in storing and copying data, documents, files and folders from and into computer systems.

Secure Digital (SD) card: The SD cards are your memory cards which can be used in mobile phones, digital cameras, and handheld computers. Files, music, movies and other information can be copied into SD card from or to computer-aided technologies.

Compact Disk (CD)): It is a storage device used in recording audio music, transferring information or data into or from the computer system.

Digital Versatile Disc (DVD): It is an external storage device use in storing digital data such as software programs, files and is used in storing and viewing video plays or movies.

Floppy diskette: It is a storage device in a computer system but has disappeared in many computers because it has small and unreliable storage capacity.

3.3   Peripherals

A peripheral is a device that can be attached to the computer processor. Peripheral devices can be external, such as a mouse, keyboard, printer, monitor or scanner. Peripheral devices can also be internal, such as a CD-ROM drive, DVD-R drive or modem. A peripheral device is defined as a computer device, such as a keyboard or printer, which is not part of the essential computer (i.e., the memory and microprocessor). These

auxiliary devices are intended to be connected to the computer and used. Peripherals comprise the most significant component in any computer system for three reasons. Firstly, it is the most visible part of the hardware, as peripherals provide the interface between the human user and the system. Secondly, it constitutes a significant portion of the total cost of the system, and thirdly, it is often a significant contributor to the performance constraints of the system.

Peripheral devices are usually classified as:

1.   Input Devices,
2.   Backing storage devices (Output Device).

3.3.1 Input Devices

Input can take a variety of forms; from commands, you enter from the keyboard to data from another computer or device. A device that feeds data into a computer processor is called an input device. Examples of common input devices are keyboards, mouse, joystick, microphone and scanner.

3.3.2 Backing Storage Devices

Output can also appear in a variety of forms - text, video, graphics, and so on. A device that shows data from a computer processor is an output device. Examples of common output devices are monitors, laser printers, inkjet printers, speakers and headphones.

The Backing storage devices are devices that hold and retain data in a computer. These devices allow the user to save data more permanently than RAM so that data is not lost and may be used at a later time. Examples of common backing storage devices are hard disk drive, floppy disk drive, CD-RW drive, flash memory and DVD-RAM drives.

4.0   CONCLUSION

In this unit, you learnt the hardware components of the computer system that is made up of the processor, Main Memory, Secondary memory, input and output devices. You also learnt about the categorization of these components into input, processing, storage and output devices. This unit concluded with you learning about peripherals, these are auxiliary devices attached to the computer system.

5.0   SUMMARY

The hardware components of the computer system provide the platform on which Library Application Software Packages are installed. You will be interacting with these components when you use library application software packages. For more study log into this link: https://www.youtube.com/watch?v=CTNtf-oGLgY on Input Devices: Keyboard, Mouse, Joystick: Tutorial.

6.0   TUTOR-MARKED ASSESSMENT

1.   What is computer hardware?
2.   List five computer hardware you know?
3.   Explain the peripheral devices that are connected to the computer?

7.0   REFERENCES/ FURTHER READING

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UNIT 3   SOFTWARE COMPONENTS OF A COMPUTER

CONTENTS

1.0   Introduction
2.0   Intended Learning Outcomes (ILOs)
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      3.1   Definition of Software
      3.2   Types of Software
      3.3   Categories of Application Software
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5.0   Summary
6.0   Tutor-Marked Assignment
7.0   References/Further Reading

1.0 INTRODUCTION

Welcome to this unit, you have learnt about the computer hardware and its components in unit 2. In this unit, you will be introduced to the concepts of software, types of software and the categories of software that is used in different organizations. The software provides the interface between the computer and its users by availing the user with the capabilities of the computer in solving the user's problems

2.0   INTENDED LEARNING OUTCOMES (ILOs)

By the end of this unit, you will be able to:

- define the concept of software.
- identify the different types of software (System software and application Software).
- explain the different categories of Application Software

3.0   MAIN CONTENT

3.1   Concept of Software

The software also called Computer Software is any set of logical instructions that tells the computer what to do to accomplish user-oriented tasks. In telling the computer what to do, the software brings together other resources of the computer like other programs, procedures, rules, data and associated documentation that is needed by the user to accomplish tasks.

The software contains a clear and complete description of each user-oriented task in terms of available operations and resources of the

computer that will be needed to carry out the tasks. The software contains a set of programs for a computer. Each program is a complete specification of the processing to be performed on the data supplied to the computer by the user. The software could either be a single program or a set of programs. Several of these programs integrated form software. The software, therefore, is a generic term for organized collections of programs. There are two types of Computer namely; Software; System and Application Software.

3.2   Types of Software

There are three types of Computer Software in use are:

a.   System Software and
b.   Application Software
c.   Utility Software.

3.2.1 System Software

System Software is computer software designed to operate the computer hardware to provide basic functionality and to provide a platform for running application software. It refers to the operating system and all utility programs that manage computer resources at a low level.

The system software is responsible for controlling, integrating, and managing the individual hardware components of a computer system. This is done that other software and the users of the system see it as a functional unit without having to be concerned with the low-level details; such as transferring data from memory to disk, or rendering text onto a display. Generally, system software consists of an operating system and some fundamental utilities such as disk formatters, file managers, display managers, text editors, user authentication (login) and management tools, and networking and device control software.

The followings are examples of the system software in a computer system
- Personal computer disk operating system (PC/M)
- UNIX and XENIX used for computer networking
- Microsoft Disk Operating System (MSDOS)
- Control Program for Microprocessor (CP/M)
- Window Operating System which aids or allows the running of more than one application program at a time.
- Digital Research Disk operating System(DR DOS)
- LINUX
- ADD

3.2.2. Application Software

SOURCE:http://courses.cs.vt.edu/csonline/OS/Lessons/Introduction/onion-skin-diagram.gif.
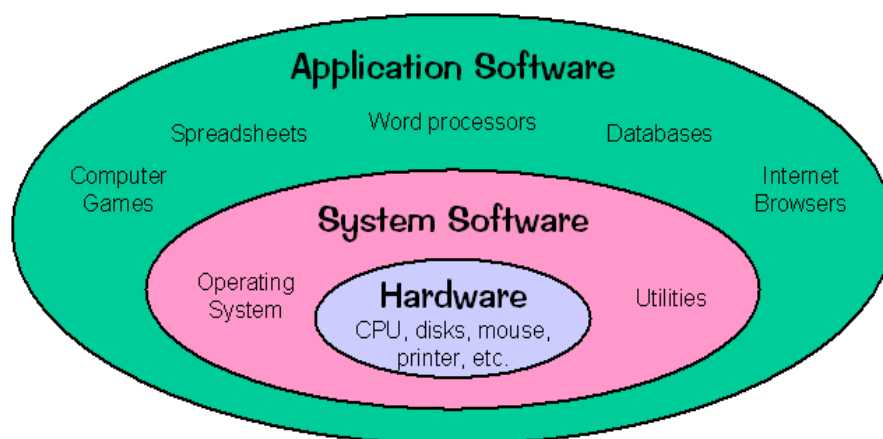
Application software is used to accomplish specific tasks other than just running the computer system. Application software may consist of a single program, such as an image viewer; a small collection of programs (often called a software package) that work closely together to accomplish a task, such as a spreadsheet or text processing system; a larger collection (often called a software suite). The application software is related but independent programs and packages that have a common user interface or shared data format, such as Microsoft Office, which consists of a closely integrated word processor, spread sheet, database, etc. The software system, such as a database management system, is a collection of fundamental programs that may provide some service to a variety of other independent applications.

3.3   Different Categories of Application Software

Application software is also known as end-user software as this software used by end-users to complete their task. There are two types of application software as follows:

1.   Basic Application Software
2.   Specialized Application Software

3.3.1 Basic Application Software

Basic Application software is general purpose applications that are widely used in every disciplines and occupation. These applications are also known as productivity applications. They perform utility operations. Examples of these general-purpose applications include:

Word processing software: This application is used to create text-based documents like organizational memos, letters, faxes Newsletters, manuals, and brochures. They enable users to edit documents interactively. This is done by enabling user redraft and merge chunks of existing documents, without the need for extensive retyping. Most of the popular programs contain features such as spell checks, outlining, and choice of fonts, line drawing and page layout facilities. Word processing software permits the user to manipulate the text. Examples of Word processing software includes Microsoft Word, Corel WordPerfect, Apple Pages, OpenOffice Writer and.

Spreadsheet Software: these are interactive applications that organize, analyze, and graph numeric data in a tabular form. The application operates on data represented as cells of an array, organized in rows and columns. Examples of spreadsheet software include Microsoft Excel, Apple Numbers, Open Office Calc.

Database Applications: these are sets of applications that enable users to store, modify and extract information from a database (Collection of related records in different tables). These applications typically support querying of the records contained in the tables of the database using structured high-level query languages. Examples of Database Applications include Integrated Library Software, Computerized inventory systems

Education Application Software: These include packages like DBASE ATI, Word perfect ATI, Learn Dos and Typing Tutor use in learning about computer hardware and software.

Game Application software: This application software that enables you to play a game with your computer. Examples of this software package are Golf, Snooker, Test-drive, Football, etc.

Communication Application Software: The software permits you to use the computer as a communication gadget. Examples of such computer software packages are Ms-com, Net-com and Net Ware etc.

3.3.2 Specialized Application Software

Specialized Application Software is programs that more narrowly focused on specific disciplines and occupations. They are also known as special-purpose applications. They allow us to perform advanced computing tasks. Examples include Web design, graphics, audio and video editing, artificial intelligence, and cell phone apps.

3.3.3 Utility Software

The utility software in a computer system is packages that stores in the hardware of a computer. It helps in diagnosing computer problems, detecting, removing and preventing the virus from contaminating the system. Examples of such software packages are:

a.   Anti – Virus tools or the security of the files and application examples are AVG and Microsoft security essentials
b.   PC tools
c.   Norton Disk Doctor (NDD)
d.   Doctor Solomon etc.
e.   Data recovery to help gets back lost data. Examples include iCare Data Recovery, Recuva, and EaseUs Data Recovery Wizard
f.   File Compression to optimize disk space such as WinRAR, Winzip, and 7-Zip.
g.   Hardware diagnostic services examples are Hard Disk Sentinel, Memtest, and Performance Monitor
h.   Firewall for protection against external threats, e.g., Windows Firewall.

4.0   CONCLUSION

In this unit, you learnt about the software component of the computer. You learnt about the types of software; the system software, application software and utility software. You also learnt about the different categories of Application software.

5.0   SUMMARY

This unit introduced you to the concept of software. Since this course is about Library application software packages, you were introduced to the concept of application software. This will hopefully serve as an introduction to application packages.

6.0   TUTOR-MARKED ASSESSMENT

1.   Explain the different types of software?
2.   What is an Application Software?
3.   Discuss the various types of application software?
4.   Outline the different categories of specialised Application Software?

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UNIT 4   SOFTWARE PACKAGES

CONTENTS

1.0   Introduction
2.0   Intended Learning Outcomes (ILOs)
3.0   Main Content
        3.1   Definition of Software Packages
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4.0   Conclusion
5.0   Summary
6.0   Tutor-Marked Assignment
7.0   References/Further Reading

1.0   INTRODUCTION

Welcome to this unit, in this unit you will be introduced to the concepts of software Packages, the different areas to apply software packages in different spheres of life, their advantages and disadvantages. Software packages bundle different application software to ease the performance of a specific task.

2.0   INTENDED LEARNING OUTCOMES (ILOs)

By the end of this unit, you will be able to:

• define the term software packages
• examine the criteria for selection of Library software
• identify areas software packages can be applied
• discuss the advantages of software packages
• discuss the disadvantages of software packages.

3.0   MAIN CONTENT

3.1   Definition of Software Packages

Software packages are a set of related applications/programs that provide solutions to various types of task. These software packages are sometimes called Suites. They bundle together different applications under a common user interface for users to be able to learn and use each application in the package. Microsoft Office and OpenOffice.org are some common examples. They bundle together a word processor, a spreadsheet, a presentation application, and a database application in one

package and are sold as a unit. They are simply multiple applications or code modules that work together to meet various goals and objectives. Software packages are commercially supplied products which typically provide solutions to a particular range of software development or applications problems.

Software packages/suites and integrated software packages are often mistakenly used synonymously. The difference is that while a software package/suite is a collection of individual programs bundled together and are made available as a unit, integrated software is a collection of programs that work similarly.

The majority of software packages share the following characteristics:
- They are frequently leased or licensed, rather than sold.
- They are usually provided in object code form and are restricted to certain computer systems for use.
- User documentation is provided with the package.
- Maintenance of the package is separately priced, but a warranty period is often provided.
- Training is provided, perhaps separately priced.
- Updates to the package are expected.
- Installation of the package is sometimes provided by the vendor.

3.2   Criteria for Selection of Library Software

Criteria to consider as a librarian before selection a software package for your Library are as follows;

a)   Need assessment of the library and the need of the community the library is meant to serve.
b)   The credibility of the manufacturer/developers of the software package.
c)   Availability of local technical support for solving troubleshooting, updating and installation of the software.
d)   Frequency of upgrading and updating to incorporate innovations,
e)   Users Interface/Users friendly and easy to operate.
f)   Cost-effectiveness, will your library enable to finance the operation or is it free
g)   System analysis: Configuration capacities (RAM and Hard disk space) and compatibilities with computers,

3.3   Areas of Application of Software Packages

Software Packages are used are
1.   Business
2.   Medical Field,

3.   Homes, and
4.   The library.

3.3.1 Business

Almost every business uses computers to complete daily tasks. From making contact with clients to inputting data for reports, computers allow businesses a more efficient way to manage affairs when compared to traditional paper and manila folders. Computers allow businesses to create websites, stunning ads and complete marketing campaigns. Marketing videos can be edited and custom ads created in-house with the use of specialized software.

3.3.2 Medical field

Computers have become an essential part of every hospital. From doing basic things such as storing the details of patients, to more specific applications such as open-heart surgeries, X-rays, clinical tests, etc. Computers in the hospital also play a vital role in numerous specific purposes, apart from the administration, accounting, billing, and appointments. They help doctors in performing surgeries, especially laparoscopic surgeries, where they insert operation tools and a small camera through a small incision made at the location of the surgery, and perform the operation with computers and monitors to guide them.

3.3.3 Homes

At homes, software packages are used in a variety of ways. Computers in Homes provide training, technical support, computers and home Internet to students' families in participating in low-docile schools. The computer can be used to manage the home budget. The user can easily calculate expenses and income. Software packages can list all expenses in one column and income in another column. Software packages can apply any calculation on these columns to plan the home budget.

3.3.4 The Library

The software packages on the Computers in the library store documents as soft copy for students'/faculty members use. Others provide online magazines, journals, brochures, research articles. Other software packages that records of the books/record of the books maintained using special library software, they also keep records of the issues and returns of the books.

3.4   Advantages of Software Packages

The following are some of the advantages of software packages:

1.   **Timely Availability**
       A software package has already been developed and is usually available immediately. When compared to the development of a system, this availability can be a significant advantage. Considerable lead time is required to develop software; perhaps 24 months or more for a large system. Also, schedule slips are typical of custom development. The benefits realized by having a package operational during this period rather than utilizing a current system while awaiting completion of development can often be the largest advantage of package acquisition.

2.   **More predictable Cost**
       Cost is a significant advantage of software packages. Costs are visible and known, as the vendor has an established and quoted price. Purchasing a software package usually consists of purchasing a license to use the package on a limited rights basis. For example, the purchase of a package may be limited to one computer for a specified price, with a reduced price scale available for installation on additional computers. There are fewer hidden or unexpected costs, so the problems associated with estimating the costs of custom developments (which often experience overruns) are eliminated.

3.   **Lower Cost**
       The cost of a software package is usually lower since the vendor spreads the cost of developing the package over an expected sales volume. Custom development costs, on the other hand, are borne entirely by one organization. Also, "cost of developing package training material and document is spread among package users while the user of custom-developed software must bear the entire cost. Maintenance of off-the-shelf software packages is usually obtained through the purchase of a contract to provide a specified level of service. Frequently, the cost of an initial year's maintenance service will be included in the purchase price. This lessens the workload of the in-house maintenance staff, resulting in another cost-saving.

4.   **Documentation**
       A set of user documentation is provided by the vendor with the package and can be previewed before purchase. This documentation has evolved with use by other customers and is often professionally done. Documentation of custom-developed

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software is notoriously poor, usually done at the last moment, and often not oriented toward the user. Good documentation is a significant advantage, as the acceptance of a system by users is often greatly influenced by how well the documentation aids them in its operation.

5.   Reliability

packages tend to be more reliable than custom-developed software. They are usually well tested and have been used by other organizations. Custom-developed Systems must go through extensive testing before they may be used reliably, and even they often contain latent errors which may not be detected until after months or years of use.

6.   Vendor Support

Depending on the purchase contract, the package delivery may consist of either tape or accompanying documentation or actual vendor installation. The provisions of the purchase contract will directly determine the level of support provided with delivery. If delivery is by mail, the site staff must be capable of "bringing the system up," and training staff personnel in its proper usage. In cases where the vendor provides installation support, the vendor provides a training staff that delivers and installs the package and trains resident personnel. Often, this results in excellent service at a nominal cost. Traditionally, there is a warranty period after the vendor staff leaves the facility. During this period, the vendor staff is on call to answer questions and fix any bugs that might be encountered.

7.   Existing User base

The fact that a software package has an existing user base can be of immeasurable advantage. Current users can be surveyed about the quality and suitability of documentation, maintenance, training, and vendor reliability. Also, on-site demonstrations of a system may be arranged, enabling potential users to judge whether the system meets their needs in terms of special features and the less quantifiable area of "user-friendliness. "As a direct result of the growth of software packages, there is often a wide variety of hardware implementations for a package. Unless a hardware configuration is quite unusual, it should not hinder the implementation of an appropriate package. Thus, the main criterion upon which the selection of a package should be based is how well the functional capabilities of the package meet user requirements.

3.5 Disadvantages of Software Packages

The following are some of the disadvantages of software packages:

1. **Functional Requirements**
   a software package is not without pitfalls and hazards. Statement of user requirements in a form that can result in the selection of an optimal package is a difficult, multi-step procedure. Only after the user requirements have been stated and matched to achieve the best fit to a package can success be insured. Ensuring that a package meets the specific requirements of an organization is critical to its successful implementation. In contrast, a developed system can be built to the specific requirements of an organization.

2. **Flexibility**
   , laws, policies and procedures constantly change and a software package must be adaptable to these changes. The flexibility which, if anticipated, can readily be built into a custom developed system, must be insured in a purchased product. This need can be handled in two ways. First, the vendor can be held responsible for making necessary changes. Most vendors will do this for a fee or may issue updates based on known changes in federal or state regulations and laws as part of their service. Second, the purchasing organization may assume responsibility for making changes. Usually, however, a software package is purchased in a form that does not easily permit changes. This form is called object code (as opposed to source code). If a user insists on changes, the vendor may withdraw all support for future package modification and void them maintenance contract. In many cases, this situation is being resolved by the marketplace. With a more competitive market and more reputable vendors, there is a wider selection of packages, packages are more adaptable and vendors are more willing to work with a customer.

3. **Vendor reliability**
   It is important when selecting a package to ensure that the vendor is well established and committed to the product. This problem is not as relevant to in-house custom developments since an in-house development staff is readily available for support.

4. **Conversion**
   A problem that can occur with the installation of a new software package is an underestimation of the magnitude of adjustment to the conversion or transition to a new package. The euphoria that commonly sets in after the package is selected and purchased contributes to the masking of the sheer magnitude of the

conversion and learning tasks. Needless to say, this euphoria rapidly evaporates when the purchased package fails to perform to expectations. Using perspective in the selection and acquisition process usually prevents underestimation of the amount of effort required to get the job done.

5.   **User Acceptance**
         A commonly encountered obstacle along the path of a successful installation is user acceptance and adaptation to the new way of performing old tasks. Although the package selected may appear to management as a best fit, lower-level staff members may be required to significantly alter specific task routines. Usually, when a software package is purchased, the users are required to arrange current operational procedures so they are compatible with the new software. The skill with which the package was selected determines the level of effort required for installation of the pack is. Most commercially available packages allow some flexibility in functional definitions; however, the user must expect and adapt to changes in current procedures that may be required. Sometimes, because of the change of routine, staff members will openly exhibit resentment and hostility to the new procedures. One way to avoid resentment is to provide a proper introduction of the capabilities of the package by emphasizing the improved efficiency and elimination of dull, tedious tasks.

Unfulfilled expectations of package performance and inadequate vendor support are the most commonly encountered problems. Usually, unfulfilled expectations are due to a lack of planning by the customer. Careful consideration of vendor reliability and support before package purchase can be a decisive factor in the success of package implementation.

4.0   CONCLUSION

Software packages are a set of related applications/programs that provide solutions to various types of the task being carried out with computer systems. In this unit, you learnt about software packages. In buying a software package the user requirements have to be stated and matched to the available software package to achieve the best needs of the user. These software packages are used in business, medical field and the libraries. You finally learnt the advantages and disadvantages of using software packages.

5.0   SUMMARY

This unit you learnt about the concept of software packages and the areas where these software packages can be applied among which is in the library, business, medical field, and homes.

6.0   SELF - ASSESSMENT EXERCISE

1.   Define the term Software Packages?
2.   Outline the areas software packages can be applied?
3.   Discuss the advantages of software packages?
4.   Discuss the three disadvantages of software packages?

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MODULE 2   LIBRARY   HOUSEKEEPING
                                     OPERATIONS

INTRODUCTION

In this module, Library Housekeeping operations will be discussed. These are the routine operations that are performed daily in the libraries. They are the operations that Library software is meant to automate. This will prepare and introduce you to these concepts because they will be used through this course material.

Unit 1   Housekeeping operations
Unit 2   Library Automation
Unit 3   Retrospective Conversion
Unit 4   Institutional Repositories

UNIT 1   LIBRARY HOUSEKEEPING OPERATIONS

CONTENTS

1.0 INTRODUCTION

gone through the first module where you studied computer components namely the hardware and the software packages used in the computer for processing of data, storage and retrieving of information from the computer system. This unit will introduce you to the library housekeeping routine operations and daily tasks. In this unit, you will be introduced to Library housekeeping operations and the different types of these operations. These operations are performed by librarians and they are usually repetitive.

2.0 INTENDED LEARNING OUTCOMES (ILOs)

By the end of this unit, you will be able to

- Define the term library housekeeping operations
- Identify the different types of housekeeping operations carried out in a library.

3.0 MAIN CONTENT

3.1 Concept of Library Housekeeping Operations

one of the basic requirements of a library however big or small is that they perform some minimum number of basic operations. These operations are conventionally referred to as 'House-keeping Operations'. They are Acquisitions, Serials Control, Cataloguing and Circulation. The performance of a library largely depends upon the organisation of its housekeeping functions and its operations. Their operations are highly labour intensive routine clerical activities performed by human beings.

With the advent of Information and Communication Technologies (ICT) automation of housekeeping operations has become the priority of most of the libraries. This is mainly because automation of housekeeping operations helps libraries to minimise human efforts and repetitive tasks, redefine library workflows, prepare staff to multitask library operations and make staff more productive in library work. Automation of library housekeeping operations is considered especially a critical area from which future benefits will emerge.

3.2 Types of Library Housekeeping Operations

The following are the major Library Housekeeping operations:

1. Acquisition
2. Serial Control
3. Cataloguing Control
4. Circulation Control

3.2.1 Acquisition

The acquisition encompasses all aspects of the procurement of all types of library materials whether by gift or exchange, from the request stage through the transfer of materials to cataloguing. Acquisition of documents is one of the basic functions associated with any library. A library must acquire and provide all the relevant documents to its users within its budgetary limitations. An acquisition subsystem performs four basic

operations. They are selection, ordering, receiving and accessioning of documents.

i. **Selection:** Selection of documents for library users is a very responsible job and should be based on definite principles and accepted norms. For a given library the book budget is limited and it should be spent judiciously to provide services to an optimum number of library users. Therefore, book selection becomes necessary. There are several tools (such as bibliographies, publisher's catalogues, etc.) which will be useful to library staff in the selection process. Requests from library users and suggestions from library authority are also considered for selection purposes. Such selections of documents need the approval of the competent authority before they are ordered for purchase in the library.

ii. **Ordering:** This procedure starts with pre-order searching, especially to avoid duplicate orders. In the next stage, purchase orders are generated and placed either directly to the respective publishers or the list of vendors duly approved by the competent authority. Additionally, generation of reminders for overdue items and cancellation of orders also comes under the purview of the ordering procedure.

iii. **Receiving**
Documents and invoices or bills usually arrive together. Bills are checked with the order list before processing for payment. Newly arrived books are tallied with the bills and the order list to check whether the books received are as per the order and the author, title, edition, imprints and price are correct before accessioning. It is essential to ensure that books are not defective in any way before accessioning.

iv. Accessioning
A stock register is maintained by libraries in which all the documents purchased or received in exchange or as a gift are recorded. Each document is provided with a consecutive serial number. The register is called Accession Register and the serial number to each document is referred to as Accession Number of the document. Accession register is one of the important records of the library. All the above-mentioned procedures and related activities of the acquisition subsystem can be mechanized through 'library management software'. In such a system these basic activities are linked with the files of publishers, suppliers, budget and fund accounting, currency, etc. These files are maintained in computer-readable form and are utilized appropriately.

3.2.2 Serial Control

Serial Control refers to those tasks which support the procurement and management of serials collection in a library. The term 'Serials' denotes those publications which are issued in successive parts regularly, usually, but not necessarily, at regularly scheduled intervals and usually having numerical or chronological designation. Serials in general and periodicals, in particular, are essential for research and development (R&D) activities. These are the primary means of communication for the exchange of scientific information.

3.2.3 Cataloguing Control

Cataloguing system is a traditional and fundamental activity practised among libraries world over. Cataloguing systems, whether manual or automated, encompass two interrelated activities: descriptive cataloguing and the production of the library catalogue. Automation support to cataloguing has benefited both thee aspects. As an intellectual activity requiring considerable decision making, descriptive cataloguing is time-consuming. As a result, many libraries experience cataloguing backlogs which impede the flow of materials into the library. This will result in library catalogues not representing the collections fully and accurately. As a labour-intensive activity requiring special training and sometimes considerable experience, descriptive cataloguing, can prove expensive, so much so that the cost of cataloguing of a given item may approach or even exceed the value of the item itself. To avoid this, libraries keep inexpensive and not-so-important materials that are not catalogued. In an attempt to simplify the decision making, save time and reduce the cost associated with the descriptive cataloguing, libraries have historically relied upon a practice called "cataloguing with copy"'. In "cataloguing with copy" which is published library catalogue and bibliographies of descriptive catalogue information prepared by the other libraries. Even with this, labour intensive work is not eliminated. Many libraries have to modify the cataloguing information to conform to local practice.

3.2.4 Circulation Control

Circulation, by definition, encompasses all aspects of patron loan processing and management, including closed reserves, holds, material booking and in-library use of the collection. Circulation is a central and highly visible function of a typical library. Circulation, which is often compared with inventory control, involves a great deal of record-keeping and correspondingly consumes staff time. It is highly essential that the records have to be accurate and all information has to be updated immediately after each transaction.

Most libraries lend books and other library materials to be read elsewhere by users. This is convenient for the users; this increases the use made of library collections and reduces the demand for reading space within the library building. This function requires some sort of record-keeping of what has been lent and to whom. The reasons for keeping loan records are:

- to minimise the loss of library materials; and
- to help library staff to answer users' queries about the location of items not on the shelves.

variety of systems for record-keeping of loans has come into being based on needs. These are known as circulation systems. These involve some common jobs for successful implementation such as enrolment of members, issue and return of library documents, reservation of documents, renewal of documents, maintenance of documents and records, maintenance of statistics, inter-library loan, issuing of gate pass, etc.

4.0 CONCLUSION

In this unit, you learnt about library housekeeping operations like Acquisition of information resources, serial control, cataloguing control, circulation control. These are the operations that need to be automated with library application software packages.

5.0 SUMMARY

This unit introduced you to library housekeeping operations. These are the daily routine activities that librarians carry out. With the advent of Information and communication technology, these operations constitute the different tasks that library software are packaged to automate.

5.0 SELF – ASSESSMENT EXERCISE

1. Define the term library housekeeping operations?
2. List and explain the different types of housekeeping operations carried out in a library?
3. What are the major stages involved in the acquisition of information resources in a library?
4. Define the term cataloguing system?

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UNIT 2   LIBRARY AUTOMATION

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1.0   Introduction
2.0   Intended Learning Outcomes (ILOs)
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          3.2   Types of Library Automation
4.0   Conclusion
5.0   Summary
6.0   Self – Assessment Exercise
7.0   References/Further Reading

1.0   INTRODUCTION

Welcome to this unit, in the last unit you learnt about library housekeeping operations. In this unit will introduce you to the concept of library automation which helps in improving library housekeeping operations. This unit will also introduce you to the different types of library automation.

2.0   INTENDED LEARNING OUTCOMES (ILOs)

By the end of this unit, you will be able to:

• Explain the concept of Library Automation
• Discuss the different types of Library Automation.

3.0   MAIN CONTENT

3.1   Library Automation

Library automation is the general term that is used when Information Communications, Technologies (ICT) are used to replace manual systems in the library. It is the use of Information Communications Technologies (ICT) in the libraries and information centers in performing manual library operations/routines. Library automation helps libraries in the optimal utilization of resources, increased operational efficiencies and network access to systems and resources on the Web, resource sharing, better quality library services and improved user experience in using libraries and library services. Library automation covers several different areas of library work. These include:

(i)   housekeeping operations,
(ii)   information retrieval

(iii)   digital asset management,
(iv)   networking libraries,
(v)   Internet and Web-based services,
(vi)   Electronic library resources on CD-ROM and the Web,
(vii)   digitization operations,
(viii)   remote access to libraries and library resources and
(ix)   Office automation.

Library automation refers to the computerization of the entire library housekeeping operations like acquisition, cataloguing, circulation & serials control. It also encompasses the handling of a large quantity of data and information more efficiently and quickly with the help of computers and other modern information technologies.

The term 'Library Automation' in the past was used to refer to the mechanization of the traditional library operations like acquisition, serial control, and cataloguing and circulation control. Today, it is used to refer computerization of not only traditional library activities but also such related activities as information organization, information storage, retrieval and usage.

3.2   Types of Automation

There are three major ways to automate the libraries namely;

1.   Using in-house library management software;
2.   Using commercial library management software and
3.   Using open source software.

3.2.1 In-house Software

Some of the software is developed by local expertise. Many organizations or colleges have used their skills and efforts in developing library management software. These types of software's name or their index or any information are not available or it is unpublished work. There are so many reasons behind in-house software being replaced by commercial software. The main reasons are mobility of Information Technology (IT) expert towards the IT industry and changing technology was affected to update LMS versions and reducing prices as compare to old prices.

3.2.2 Commercial Software

This commercial software is also introduced with good features, more security and advanced technology. The cost of the software, updating charges, service problems and benefits taken by the library, instead of paid amount is creating headache to the organizations.

3.2.3 Open Source Software

Open source software has two basic properties, the first one is `Source Code` or programme and another is, it is illegal to convert an open source software into a proprietary version or commercial version. Open source software is similar to a peer review, which is used for the progress of LMS. The open source model replaces central control with collaborative networks of contributors. Every contributor can build on the work that has been done by others in the network, to reduce the period in reinventing the wheel

4.0 CONCLUSION

In this unit, you learnt about library automation, which is the use of ICTs in performing library housekeeping operations that you learnt about in the preceding unit. You also learnt the different types of library automation methods.

5.0 SUMMARY

This unit introduced you to library automation. This is the use of Library software in performing the daily routine activities that librarians carry out in the library. There are different types of automation namely Using in-house library management software; using commercial library management software and using open source software.

6.0 SELF – ASSESSMENT EXERCISE

1.   Explain the concept of Library Automation?
2.   Outline some of the areas where Library automation can be used to carry out work in the .library?
3.   Discuss the different types of Library Automation

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UNIT 3   RETROSPECTIVE CONVERSION

CONTENTS

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1.0   INTRODUCTION

Welcome to this unit, in the last unit you learnt about library automation. You may be wondering how the library can carry out these operations when the existing bibliographic records are in printed format. This unit will introduce you to how automation can be carried out through the concept of retrospective conversion. This unit will also introduce you to the different types of retrospective conversion and standards for retrospective conversion.

2.0   INTENDED LEARNING OUTCOMES (ILOs)

By the end of this unit, you will be able to:

- Define the concept of Retrospective conversion
- Identify the different methods of retrospective conversion
- Outline the standards for retrospective conversion.

3.0   MAIN CONTENT

3.1   Concept of Retrospective Conversion

Retrospective conversion is the conversion of the library's existing bibliographic records from manual to machine-readable format according to specified policies and standards. Retrospective conversion means the conversion of the existing records in manually produced catalogues into machine-readable form. Retrospective conversion is a major component of the library automation process. Retrospective conversion in library and information center means "changing already existing catalogue from existing traditional form to a machine-readable form.

It is also the process of converting the database of library holdings in the form of bibliographic records from non-machine-readable form to machine-readable. The conversion of a database of library holdings from non-machine-readable form to machine-readable form is a pre-requisite to implementing an automated system. This database would become the foundation for other library activities such as online public access catalogue (OPAC), circulation, catalogue maintenance, resource sharing, etc. These records provide the means of generating statistics and other information that is needed to improve the existing services and introduction of a new one.

3.2   Methods of Retrospective Conversion

 The following are methods of undertaking Retrospective Conversion:

1.   **In-House Conversion**
2.   **Outsourced In-House Conversion**
3.   **Outsourced Off-site Conversion**

3.2.1 In-House Conversion

In in-house conversion, the conversion is completed by the existing library staff that leads to high quality and control, as the staff understands the users' needs, quality requirements, and the objectives of the conversion well. This option is the simplest option which can be utilized by libraries. The process is quite wherein the data from the shelf-list card is captured into the machine-readable form in the computer system to create a database of records.

3.2.2 Outsourced In-House Conversion

In outsourced in-house conversion, the conversion is completed by outside contracted persons within the library premises.

3.2.3 Outsourced Off-site Conversion

In outsourced off-site conversion, the process is completed by an agency away from the library or information center. The advantage of it is only that the process is completed within the time frame with less impact on the library's routine work.

3.3   Standards for Retrospective Conversion

In undertaking any Retrospective conversion project, it is very essential to adopt the standards. The libraries undertaking the retro-conversion work must take into account the standards like the record format and the

structure, descriptive and subject cataloguing standards, classification schemes, and also the authority control. The standards for retrospective conversion include;

1.   Cataloguing Level
2.   Use of AACR II
3.   Use of MARC Format
4.   Use of Subject Access System
5.   Use of Classification Systems
6.   Use of Authority Control Tools

3.3.1 Cataloguing Level

Since different libraries adopt different levels of cataloguing, libraries must have as a complete bibliographic record as possible since it would facilitate better and effective searching by the end-user. The modern information retrieval systems can be better utilized with sophisticated searching techniques if the bibliographic records carry more information. Furthermore, the records with brief bibliographic information already created in the libraries could be further upgraded to the fuller bibliographic records during the retro-conversion work.

3.3.2 Use of AACR II

AACRII is the widely used cataloguing code and libraries must adopt it to bring uniformity to catalogued record. During the process of retrospective conversion, if the resources are catalogued using the pre-AACRII format, the cost of re-cataloguing will be enormous, it is better to download and upgrade the catalogued records from the online systems like Library of Congress which provides access to millions of records free of charge.

3.3.3 Use of MARC Format

In this present day of shrinking library budgets, resource sharing is the order of the day. Machine Readable Cataloguing (MARC) provides the standard format to exchange machine-readable bibliographic information across various library systems. The records created during the retrospective conversion should conform to the global MARC standards to facilitate the flow of information from one system to the other.

3.3.4 Use of Subject Access System

In a retrospective conversion, Subject Access is one of the main components of a bibliographic entity. A large number of libraries are providing the subject access to the resource with the help of subject tools

like subject headings, a thesaurus or a keyword system. It should be seen during the retrospective conversion that the subject access terms derived are from the standard vocabulary to define the subject of the item being catalogued. Library of Congress Subject Headings (LCSI-I) is the most commonly used list of headings libraries. The special thesaurus like INSPEC, MESH (Medical subject headings) may also be used for the special disciplines.

3.3.5 Use of Classification Systems

The use of Classification systems in a library catalogue during the retrospective conversion is library-specific only. But it is better than the resources available in the libraries should be easily accessible by the users and the classification systems should be user-friendly.

3.3.6 Use of Authority Control Tools

A large number of Authority control tools can be utilized during the retrospective conversion. The most widely used authority control tools include the Library of Congress Name Authorities, Library of Congress Subject Authority file. The authority control files can be utilized to reduce the process of having to edit records. It is always advisable for libraries to decide whether they are going to use authority control before the commencement of the retrospective conversion project.

4.0 CONCLUSION

In this unit, you learnt about retrospective conversion, this is the conversion of the bibliographic records from manual to machine-readable form. You also learnt about the different types of retrospective conversion and the standards to be considered during retrospective conversion projects.

5.0 SUMMARY

This unit introduced you to retrospective conversion. This is the first step when a library is planning library automation. The unit also introduced you to the different types of retrospective conversion and the standards for retrospective conversion.

6.0 SELF ASSESSMENT EXERCISE

1. What do you understand by the term Retrospective conversion?
2. Discuss the different methods of retrospective conversion?
3. What are the standards for retrospective conversion?

7.0   REFERENCES/ FURTHER READING

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UNIT 4   REPOSITORIES

CONTENTS

1.0   INTRODUCTION

You have visited some libraries and observed some of the reading materials available in the library collections. In this unit, you will be introduced to the concept of repositories, different types of repositories and the types of contents that are housed in institutional repositories.

2.0   INTENDED LEARNING OUTCOMES (ILOs)

By the end of this unit, you will be able to:

- Define the concept of Repositories.
- Identify the different types of repositories.
- Explain the types of content that are housed in institutional repositories.

3.0   MAIN CONTENT

3.1   Concept of Repositories

A repository is a place where things are kept or stored for safekeeping, or a person to whom a secret is entrusted into. It can be a central location of files which are controlled by a system. Repositories can take many forms, and all sorts of websites and databases could be considered to be repositories. A digital repository is a means of managing, storing and providing access to digital content. Typically, content in an institutional repository includes research outputs such as journal articles or research data, e-theses, learning and teaching materials, and administrative data. Some repositories only store particular items (such as theses or journal papers), whilst others seek to gather any credible scholarly work produced by the institution; limited only by each author's retained rights from publishers. Putting digital content into an institutional repository enables

institutions to manage and preserve it, and therefore derive maximum value from it.

3.2   Types of Repositories

A repository can support research, teaching, learning, and administrative processes. One of the advantages of a repository is that each piece of content can be described in some detail via the input of associated 'metadata'.

The following are types of Repositories:
1.   Digital Repositories
2.   Institutional Repositories
3.   Open Access Repositories

3.1.1 Digital Repositories

A formal digital repository is where digital content, or assets, are stored and managed to facilitate searching and retrieval for later use. A repository supports mechanisms to import, export, identify, store, preserve and retrieve digital assets. It is also increasingly being recognized that repository use can be encouraged through additional services to encourage community sharing and exchange of both practice and content. The type of content held in a repository can have a significant impact on the way it is designed, managed and used. There are some very active communities working around different types of the repository - each of which has its history, culture and terminology.

3.1.2. Institutional Repositories

Repositories can be many shapes and sizes, from small specialist collections to national or international services. The institutional repositories are repositories managed by Higher Education Institutions, at the departmental or institutional level, which implies a certain level of commitment and intention to embed repository use and management into everyday work. Many institutional repositories initially focused on research outputs and some still limit their collections to this type of content. Others have started to widen the original remit to include learning and teaching materials. Whilst institutional Virtual Learning Environments have, to some extent acted as stores for learning and teaching materials, they tend not to support the search and retrieval functions required for a repository. Making this content more open, even within the institution, presents challenges for institutions with a commitment to open up their resources.

3.1.3. Open Access Repositories

Repositories are increasingly being made more 'open' to make content accessible to wider user groups, sometimes at a global level. Not all repositories are open: some are designed to support sharing within a specific group and are sometimes described as 'closed'. These repositories often require authentication and some have varying levels of access and 'degrees of openness'. "Open access" is a term that is used in a specific sense and most often used to collections of research papers. The concept of open access repositories is closely linked to open access research papers, but the idea has wider currency and is linked to concepts of open educational resources (OERs) and open content licensing.

3.2   Content Types of Repositories

Repositories may include a wide range of content for a variety of purposes and users. The focus of each repository, and, therefore, what content it will store, will depend upon the policy decisions made by each institution or administrator.

The following are some of the content types that are stored on institutional repositories:
1.   Publications
2.   Theses & Dissertations
3.   Resources used to support teaching and learning
4.   Audio Visual Items
5.   Data
6.   Grey Literature

3.2.1   Publications

Any information that is made available to users in the following forms:

- Articles - Articles in journals, magazines, newspapers. Not necessarily peer-reviewed. Maybe an electronic-only medium, such as an online journal or news website.
- Books - Complete books or conference volumes.
- Book Sections - Separately-authored chapters or sections in books.
- Conference or Workshop Items - Papers, posters, speeches, lectures or presentations given at a conference, workshop or another event.

3.2.2 Theses & Dissertations

Student theses and dissertations submitted to an institution as part of the requirements for a degree, including:
- Doctoral Theses - PhD
- Masters Theses & Dissertations - MSc, MA, MBA, etc
- Bachelors Dissertations - BSc, BA, etc

3.2.3 Resources used to support teaching and learning

These include all the information resources that are used for teaching and learning.

- Curricula and syllabuses
- Course validation documents
- Course materials - learning resources, lecture notes, learning exercises
- Assessment materials - tests, exam papers
- Study skills, support and revision materials
- Student-produced work (including all the content types listed here)

3.2.4 Audio Visual Items

These include non-print materials like:

- Images - Digital photographs or visual images
- Video - Digital video
- Audio - Sound recordings
- Show/Exhibition - An artist's exhibition or site-specific performance-based deposit
- Artefact - An artist's artefact or work product. Could also apply to archaeological finds
- Performance - Performance of a musical event
- Composition - A musical composition

3.2.5 Data

- **Datasets** - Bounded collections of quantitative data (e.g. spreadsheet or XML data file)
- **Experiment** - Experimental data with intermediate analyses and summary results

3.2.6 Grey Literature

These include resources not published in the usual academic or traditional means and distribution channels. They include:

- **Patents** - A published patent. As-yet unpublished patent applications should never be included in a repository because to do so might disqualify the application.
- Project Reports
- Documentation & Manuals
- Working Papers & Discussion Papers

4.0   CONCLUSION

In this unit, you learnt about repositories and the types of repositories. Worthy of note among the types of repositories is the institutional repositories. They are repositories that house the digital content of higher institutions. You also learnt about the different types of contents that are deposited in repositories.

5.0   SUMMARY

This unit introduced you to repositories. Repositories must often are situated in Libraries because they are libraries for the digital contents of the institutions. The unit also introduced you to the different types of contents that are saved in the repositories.

6.0   SELF – ASSESSMENT EXERCISE

- Define the concept of Repositories?
- Outline the three different types of repositories?
- Explain the types of content that can be housed in institutional repositories?

7.0   REFERENCES/FURTHER READING

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MODULE 3   LIBRARY   APPLICATION   SOFTWARE PACKAGES

INTRODUCTION

In this module, Library Application Software packages will be discussed. This will prepare and introduce you to their functions, types, basic structure and the skills and competencies that are needed by Librarians to use Library Application Software Packages.

Unit 1   Library Application Software Packages
Unit 2   Integrated Library System (ILs) and Library Housekeeping
Unit 3   The Integrated Library Systems in Use

UNIT 1   LIBRARY APPLICATION SOFTWARE

CONTENTS

1.0   Introduction
2.0   Intended Learning Outcomes (ILOs)
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          3.1   Definition of Library Application Software
          3.2   Types of Library Application Software
4.0   Conclusion
5.0   Summary
6.0   Self-Assessment Exercise
7.0   References/Further Reading

1.0   INTRODUCTION

Welcome to this unit, you have learnt in the previous unit about software packages and areas where they can be applied in the library. This unit will introduce you to the concept of Library Application Software and their types.

2.0   INTENDED LEARNING OUTCOMES (ILOs)

By the end of this unit, you will be able to:

•   Discuss Library Application Software
•   Explain the various types of Library Application Software

3.0   MAIN CONTENT

3.1   Concept of Library Application Software

Library Application software packages are sets of programs that are tailor-made to perform and automate library housekeeping routines while providing other services for database management and information retrieval. They are basically a set of programs that are packaged together to perform specific library housekeeping routines like acquisition, circulation, cataloguing serial control and reference services. They provide a one-window interface for the performance of these routines.

It is worthy of note that these library packages are fundamentally tailor-made to automate the processes and daily routines performed by librarians in the library. Library Application Software package is the general name for all library management systems. Nowadays, all these library management systems clamour to become all encompassing, performing all the functions and incorporating all the types of software requirement of libraries.

3.2   Types of Library Application Software   Packages

There are different library Application software packages, and each of them has different functionalities. The categorization of library software could broadly be done based on the:

1.   Functions they perform
2.   Source code Availability.

3.2.1 The Functions They Perform

Library software performs different functions. They can be categorized based on their functions and their areas of application in the Library.

1.   **Database Creation Software**: Modern libraries have now applied computing power for management of their records. It is the computer-based system that came to be known as Data Management System (DBMS). These systems are used for defining, creating, manipulating, controlling, managing and using databases. Library Software applications used in creating these library databases which include CDS/ISIS (Computerized Documentation Service/Integrated Set of Information System)

2.   **Library House Keeping/Management Software Packages**: The objective of any library software is to mechanize all the activities of the library. It makes the repetitive jobs of the library easy. These

repetitive jobs are the library housekeeping jobs/routines. Library housekeeping software packages are also known as library management systems/Integrated library systems. Some examples include: Libsys, OASIS, Sanjay, SLIM, and SOUL.

3.   **Repository Software Packages**: A repository is a means of managing, storing and providing access to digital content. Repositories can take many forms, and all sorts of websites and databases could be considered to be repositories. One of the advantages of a repository is that each piece of content can be described in some detail via the input of associated 'metadata'. This acts much like a catalogue record in a library management system and allows searching across items within the repository. Library software that are used to develop institutional repositories include CDSWare, Dspace, E-prints, Fedora, Ganesha digital library, Greenstone

3.2.2 Source Code Availability

Another major categorization of library software is based on the availability of the source codes of these applications. This categorization means the software is either free to install and customize to your taste or licensed/proprietary; which means one has to buy. This categorization is based on the following:

1.   **Proprietary software:** These packages are also known as closed-source software. They are applications for which the publishers of the application or another person retain the intellectual property right in form of either copyright of the source code or patent rights. In other words, users will have to buy the software. Proprietary software is acquired through vendor and its use is based on your payment of annual subscription fees. This made it difficult for many libraries to adopt the software due to its cost, Also the vendors controls the customers they decides when to do the upgrading and updating of the files. When you do not subscribe to the new version it will affect the functioning of software. An example of propriety software is Software for University Libraries (SOUL). Software for University Libraries (SOUL) is integrated library management software designed based on requirements of college and university libraries was developed by the INFLIBNET Centre. The Software for University Libraries (SOUL) software was designed to automate all the housekeeping operations carried out in the library. This software is suitable for the academic libraries, all types and sizes of libraries, even school libraries.

2.   **Open Source Software Packages**: Open source software (OSS) is computer software that has its underlying source-code' made available under a license. This can allow developers and users to adopt and improve it. According Ukachi (2015) are produced by programmers and made available to the public for use with their accompanying source code and relaxed copyright restrictions. In practice, software companies often develop both types of software. The aim is that a large community of developers and users can contribute to the development of the code, check it for errors and bugs, and make the improved version available to others. Engard in Ukachi (2015) defined Open Source Software to be an application whose source code is open for use or modification with users' needs and requirements. An example of Open Source Software is KOHA. The characteristics of KOHA as open source software are that it has a source code which allows you to distribute, download and share with others free of charge. The source code of OSS is available, user can download, install, able to modify, change and improve the software in line with your own need. There is no restriction and charges to any party for distributing the programme to other users to follow the pattern it has no discrimination against persons, group and field of endeavour. Any one is qualified to use it. Above all licence does not restrict other software that is it can be distributed along with other licenced software..

4.0   CONCLUSION

In this unit, you learnt about library application software and the various types of library application software. You have also learnt that the classification of library application software is based on the functions they perform and the availability of the software source codes.

5.0   SUMMARY

This unit introduced you to library application software, criteria for selecting library software. The types of library application software, features and characteristics were discussed. This unit also introduced you to the fact that modern library application software is designed to handle all the functions of individual classifications while leaving their source codes open if it is an open source software.

1.0   SELF – ASSESSMENT EXERCISE

1.   Explain the term Library Application Software?
2.   Outline the various types of Library Application Software?
3.   What is the function of Database Creation Software?
4.   Explain the function of library software?

7.0 REFERENCES/ FURTHER READING

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UNIT 2   INTEGRATED LIBRARY SYSTEM (ILS) AND LIBRARY HOUSEKEEPING INTEGRATED LIBRARY SYSTEM

CONTENTS

1.0   INTRODUCTION

Welcome to this unit, you have learnt about some Library application software packages and their functions in the previous unit. What is library application software? It is is set of programs that are packaged together to perform specific library housekeeping routines like acquisition, circulation, cataloguing serial control and reference services. You answered correctly. In this unit will introduce you to Integrated Library System and the features of Integrated Library System in use.

2.0   INTENDED LEARNING OUTCOMES (ILOs)

By the end of this unit, you will be able to:

- Explain Integrated Library Systems.
- Discuss the basic structure of an Integrated Library System
- Identify the major features of integrated Library System
- Library Housekeeping Subsystems

3.0   MAIN CONTENT

3.1   Integrated Library System

Integrated Library Systems (ILS) also known as Integrated Library Management systems are sets of programs and hardware that are used to perform library activities like acquisition, cataloguing and circulation. They help librarians and users to circulate and catalogue items, manage

user activities, track movement as well as interact with databases from other libraries or institutions. They were designed to conform to the fourth law of Librarianship (Save the time of the user). They are a fast emerging technology that has changed the system of the library into automatic or in some cases semi-automatic activities. They provide a centralized management process for libraries and their housekeeping routines. An Integrated Library System is a computer-based system used to manage internal and external resources including tangible assets, financial resources, materials, and human resources. It is built on a centralized database and normally utilizes a common computing platform and consolidates all library operations into a uniform and enterprise wide system. They normally have incorporated in them a relational database, software that interacts with the database and two graphical user interfaces (one for the users and the other for staff). They are referred to as an integrated system because they have separate software functions/instructions for different tasks called modules on a single window interface. This means they have the module for the different library housekeeping routines like acquisition, cataloguing, serial control, circulation etc.

3.2   Basic Structure of an Integrated Library System

Library automation processes are integrated systems of a set of interlinked modules responsible for the management of different operational subsystems. These Library Management Systems (LMSs) are based on relational database architecture. In such systems files are interlinked so that deletion, addition and other changes in one file automatically activate changes in related files. It means integrated library management system is sharing a common database to perform all the basic functions of a library. An Integrated library system (ILS) enables the library to link circulation activities with cataloging, serials control, and report generation etc. at any given time. It makes use of a file server and clients in a local area network or wide area network. Automated Library Systems now support three broad groups of library activities – i) housekeeping operations; ii) information retrieval; and iii) on-the-fly integration of library materials with open datasets. These are accessible through Local Area Network (LAN) or Wide Area Network (WAN) and also over Internet. Modern library automation systems are Web compatible and accessible through Internet, Intranet and Extranet for information retrieval as well as data entry activities. Moreover, automated library systems are now capable to be integrated seamlessly with linked open data (like name authority data, subject access systems etc.), open contents (like book reviews, table-of-contents, cover images etc.) and social networking tools (like Facebook, Twitter etc.) through semantic web technologies and information mashup.
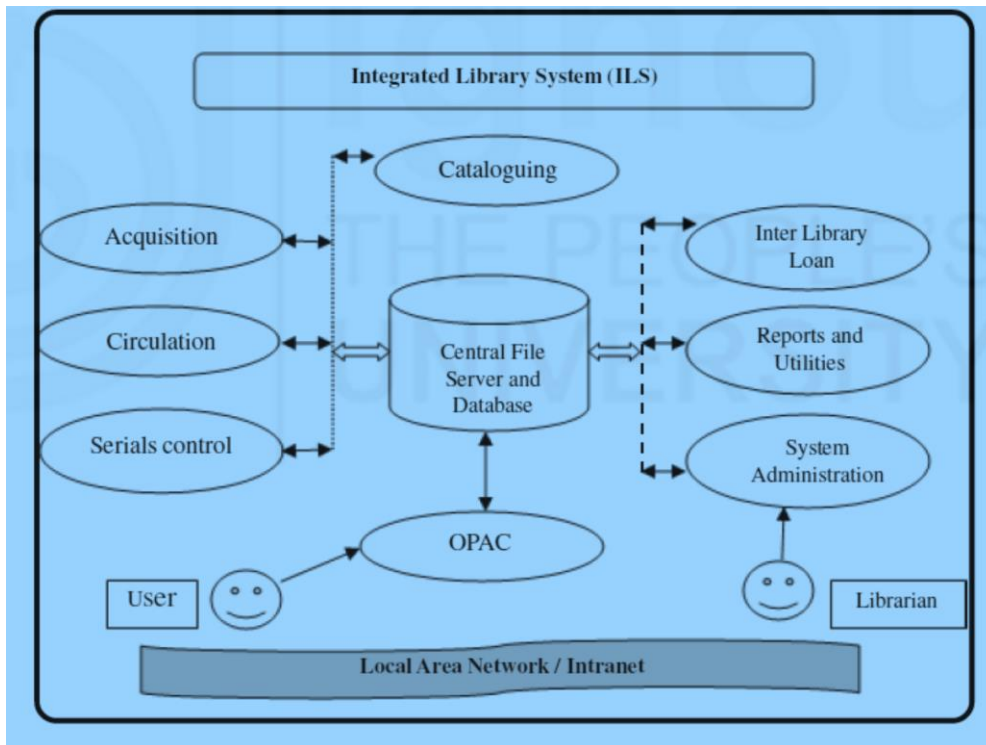
3.3   Features of An Integrated Library System

An integrated library management system has several main features, which include:

- A database – this is where all the information belonging to a library is stored, such as MARC (Machine Readable Cataloguing) records, patron information etc.
- Cataloguing module – allows librarians to add materials to the database.
- Circulation module – checks items in and out, keeping track of the location and status of the library's resources.
- User management – this enables you to add, delete and manage your library's users.
- Staff interfaces – this is the interface through which a librarian manages the ILS. Modern library management systems have web-based interfaces which are accessible through a local network or the internet via a web-browser.
- OPAC – The Online Public Access Catalogue. This is the interface through which your patrons can search for books and other items, access their accounts, place holds, track their circulation history, make payments for fees and fines etc.
- Reports – the ability to run various reports on item movement as well as staff and user activities.

3.4   Library Housekeeping Subsystems

Automation of library housekeeping system requires the analysis of workflow and activities into their atomic structure. The Procedural Model of library automation proposed by ASLIB (now Association of Information Managers, UK) acts as a base for workflow/system analysis of library housekeeping operations. The procedural model proposes two basic subsystems, four operational subsystems, three levels, eighteen procedures, six activities and fifteen basic tasks as library workflow irrespective of the type and size of libraries.

The library subsystems include:

1.   Acquisition Subsystem
2.   Processing Subsystem
3.   Circulation Subsystem
4.   Serials Control Subsystem
5.   Maintenance Subsystem

3.4.1 Acquisition Subsystem

The acquisition of documents is a prerequisite for libraries. A library should acquire and provide all the relevant documents to its users so that the basic functions of the library are fulfilled. An acquisition subsystem shall perform four basic procedures – Select, Order, Receive and Accession.

Procedures in Acquisition Subsystem
i.   Select
         Selection of documents for library users is a very responsible job and should be based on definite principles. It is done with the help of selection tools (such as bibliographies, publishers' catalogues, trade catalogues etc.) and requests/suggestions from library users/authority.

ii.   **Order**
         This procedure starts with pre-order searching, especially to avoid duplicate orders. In the next stage purchase orders are generated and placed either directly to the respective publishers or to the listed vendors/book sellers. Additionally, generation of reminders for overdue items and cancellation of orders also comes under the purview of ordering procedure.

iii.   Receive
         Documents and invoices or bills usually arrive together. Bills are checked with the order list before processing for payment. Newly

arrived books are tallied with the bills and the order list to check the author, title, edition, imprints and price before accessioning.

iv.   **Accession**
A stock register is maintained by libraries in which all the documents purchased or received in exchange or as gift are entered. Each document is provided with a consecutive serial number. The register is called Accession register and the serial number of the document is referred as Accession Number. All the above-mentioned procedures and related activities of the acquisition subsystem can be mechanized through library management software. In such a system these basic activities are linked with the files of publishers, suppliers, budget & fund accounting, currency etc. to achieve the benefit of integrated library system.

3.4.2 Processing Subsystem

The processing procedure is the pivot round which all the housekeeping operations revolve in a library. It helps in the transformation of a library collection into serviceable resources. The procedures under this subdivision are classification, cataloguing, labeling and shelving.

Procedures in Processing Subsystem
i.   **Classify**
The followings are the major classification schemes, which are used in various libraries of the world: Dewey Decimal Classification Scheme (DDC), Universal Decimal Classification Scheme (UDC), Library of Congress Classification (LC), Colon Classification (CC), and Subject Classification (SC) etc. Classification is a mental process and demands intellectual exercises from classifier.

ii.   **Catalogue**
Cataloguing is the prime method of providing access to the collection. Cataloguing procedure starts with technical reading of the document to be catalogued by studying title, sub-title, alternate title, author, editor, edition, reprint, imprint, dedication, preface, table of contents, collation, series, bibliographies etc.

iii.   **Label**
It is the work of pasting various labels on different parts of a document. The following labels are generally pasted in books:
a)   **Spine label:** This is done to make call number (a combination of class number and /author book number)

properly visible to the users when the book is shelved. The size of the label is in the range of 1.25'' × 1.25".

b) **Ownership slip/mark:** These are generally pasted on the inner side of the front cover at left hand top most corner. Ownership marks are put at various parts of a *document by rubber stamps. The size of slip is 3" × 2.5"*.

c) **Date Due slip:** It is pasted on the top most portion of the front or back flyleaf of each book. The size of date slip is 5" × 3".

d) **Book pocket:** On the bottom of the inner right side of the front or back cardboard cover a book pocket is pasted.

e) **Book card***: One printed/hand-written book card of size 5" × 3" is put in the book pocket of each book.

In a computerized environment, various labels are printed by using library management software. In case of barcode based computerized circulation.

vi   Shelve
Shelving is the arrangement of documents on the shelves to fulfill the fourth law of library science – Save time of the reader. Generally, books are arranged on the shelves in a classified manner as per the call number. Bound periodicals are generally shelved alphabetically by title and then by volume numbers. Although shelving works are generally manual in nature, Radio Frequency Identification (RFID) enabled ILS helps in identifying misplaced documents in shelves and thereby supports stock rectification.

3.4.3 Circulation Subsystems

Circulation service is quite common to libraries of different types. Most libraries lend books and other library materials to be read elsewhere by users. This is convenient for the users, increases the use made of libraries' collection and reduces demand for reading space within library building. This function requires some sort of record keeping arrangement of what has been lent and to whom. There are two good reasons for keeping loan records:

i)   Reduce the loss of library materials;

ii)   Help library staff to answer users' queries about the location of items not   on the shelves.

Procedures in Circulation Subsystem
A rich variety of systems of record keeping of loans have arisen out of such needs and these are known as circulation systems. These include some common jobs for successful operations such as enrollment of members, issue and return of library documents, reservation of

documents, renewal of documents, maintenance of documents and records, maintenance of statistics, interlibrary loan, issuing of gate pass, calculation and collection of fines for overdue documents etc. In a computer based circulation system, the machine-readable file consists of records for all items on loan from the library is updated periodically with new records. This file is called "transaction file" and it takes required data from other two files – "document file" and "borrower file". Modern library management software support barcode based circulation system. In such a system a barcode reader scans bar-coded accession number of a document and the barcode in turn acts as a pointer to the document file. It helps to minimise labour and error in data entry operation. The concept of RFID (Radio Frequency Identification) based circulation system is emerging rapidly in developed countries. It comprises three components: a tag, a reader and an antenna. The tag contains important bibliographical data. The reader decoded the information stored on the chip after receiving it through the antenna and sent data to the central server to communicate library automation system. RFID technology supports patron self-checkout machines and has the ability to conduct inventory counts without removing a single book from the shelve. As a whole, RFID improves library workflow, staff productivity and customer service with these attributes.

3.4.4 Serials Control Subsystem

Serials in general and periodicals in particular are essential for research and development (R & D) activities. These are the primary means of communication for the exchange of scientific information. The periodicals or journals subscribed by libraries can be grouped into these categories:

i)   Indexing/Abstracting periodicals;
ii)   Periodicals containing news items;
iii)   Periodicals containing full-text research articles and technical papers. Acquisition of serials/periodicals in a library is different from book ordering system. In contrast to books, the libraries regularly subscribe periodicals against advance payment.

Procedures in Serials Control Subsystem
The workflow of any serials control system, manual or mechanized, can be listed as below:

- Selection of serials
- Selection of subscription mode
- Formulation of terms of procurement
- Selection of vendors
- Order

- Advance payment
- Receiving and registration of serials issues in kardex
- Sending reminders in case of non-receipted issues
- Adjustment of advance payment for missing issues
- Preparation of list of subscribed journals, new arrivals and serials holdings for consultation by users
- Binding and accessioning of back volumes of serials
- Article indexing (optional).

In an automated system all these tasks are performed by library management software efficiently. It reduces workload of library staff. Automated serials control systems may be predictive or non-predictive. Predictive systems predict the arrival of individual journal issues and can generate reminders in case of non-receipted issues. Prediction means the ability to inform that a named issue of a named journal will arrive in the library within a stated time interval. Modern library management software supports predictive mode of serials control with the facilities of on-line acquisition and access to journals through publishers' portals or library consortia (like UGC Infonet in university libraries in India, N-LIST in colleges under UGC, India and INDEST for IITs, NITs and IIMs). In case of consortia-based access to journals, a library does not perform activities like acquisition; processing and shelving rather optimise user access to the on-line journals. The access interface may be a simple list (by publisher or by journal title) or may be a complex portal with facility for federated searching.

3.4.5 Maintenance Subsystems

If we don't take proper care to organise and administer the library documents regularly, these documents would become unserviceable resources immediately. The workflow of the maintenance division/section includes four major jobs.

Procedures in Maintenance Subsystem
Shelf Rectification: It is to shelve misplaced documents in proper locations.

Bind: It is to preserve library resources for posterior and present use.

Replace: It is to replace a lost document by the library.

Discard/Withdrawn: It is to weed out outdated and torn & soiled documents from the library for making enough space for usable stock.
The integrated library automation environment requires information on lost, damaged, missing and withdrawn documents as well as documents sent for binding. These datasets are to be entered to generate and display

appropriate messages for the library users and staff against specific tasks in different modules. This is also required to generate reports on lost books, missing books, books sent for binding etc. for the library administration.

4.0   CONCLUSION

In this unit, you learnt about the concept of Integrated Library System, it structures and features. You also learnt about library housekeeping subsystems and the procedures in all of these subsystems.

5.0   SUMMARY

This unit introduced you to Integrated Library System and the features of integrated library system, library housekeeping subsystems and the procedures that are automated by the integrated library system in each of these subsystems. You were also introduced to the basic structure of integrated library systems that aligns with the housekeeping subsystems and you learnt about integrated library system and the various features of integrated library systems. The Integrated Library Systems as you know are the combination of software and hardware components of a computer that are used to automate all the library housekeeping operations

6.0   SELF – ASSESSMENT EXERCISE

1.   Define the concept Integrated Library Systems?
2.   Enumerate the basic structure of an Integrated Library System
3.   Identify the major features of integrated Library System
4.   Explain the Library Housekeeping Subsystems?

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UNIT 4   TYPES OF INTEGRATED LIBRARY SYSTEMS

CONTENTS

1.0   INTRODUCTION

Welcome to this unit, having learnt about Integrated Library System which is a computer-based system used to manage internal and external resources including tangible assets, financial resources, materials; human resources and all library operations into a uniform and enterprise wide system.This unit will introduce you to one of the classifications of Integrated Library Systems. This unit will introduce you to Types of Integrated Library Systems namely proprietary integrated systems and open source Integrated Library Systems and some of their respective examples.

2.0   INTENDED LEARNING OUTCOMES (ILOs)

By the end of this unit, you will be able to:

- Identify proprietary integrated library system and their examples.
- Explain the open sources Integrated Library Systems
- Outline the examples of Open Sources Integrated Library System.

3.0   MAIN CONTENT

3.1   Types of Integrated Library Systems

Types of Integrated Library Systems are

1.   Proprietary Integrated Systems
2.   Open Source Integrated Library Systems

3.1.1 Proprietary Integrated Library Systems

Proprietary Integrated Systems are software and hardware that are owned by an individual or a company (usually the one that developed it.) There are almost always major restrictions on its use, and its source code is a always kept secret. Proprietary library systems are ILSs which are basically ready-made and ready-to-use systems. Conventionally, closed or proprietary systems are developed by private or commercial entities. Most often, these entities take charge in furthering the system including systems maintenance. Source codes are not shared by the companies or vendors. In so doing, libraries and information centers remain dependent to them for updates or developments.
Examples of proprietary integrated library systems are:

1.   Software for University Libraries (SOUL)
2.   Visionary Technology in Library Solutions (VTLS)
3.   Mandarin
4.   LIBSYS

2.1.1 Software for University Libraries (SOUL)

SOUL is developed by INFLIBNET Centre, Ahmedabad. One of the objectives of the INFLIBNET Centre was to develop a Library Management Software for automating the university libraries. Keeping in view the latest trends in Information Technology, it has developed a Windows based Library Management Software called "SOUL", which provides total solution for Library Automation of university libraries in India *(SOUL, 2006).*Keeping in mind the fact that university libraries are complex entities, having large collections and serving a huge clientele, the software has the flexibility. The SOUL works on Windows platform and it needs MS-SQL as the backend software. SOUL is designed using Client-Server Architecture, which imparts extra strength to storage capacity, multiple accesses to single database, various levels of security, back up, and storage facilities etc. This software has been designed after a comprehensive study of different library related functions practiced in university libraries. This user-friendly software is quite easy to work with. The software comprises all the necessary housekeeping operations such as Acquisitions, Catalogue, Circulation, OP AC, Serial Control and Administration modules. The in-built network feature of the software will allow multiple libraries of the same university to function together as well as have access to the distributed databases installed at various university libraries and union catalogue mounted at INFLIBNET by using a network. SOUL handles Indian languages/scripts by using ISM Publisher and GIST of C-DAC. It adheres to all international standards such as MARC 21, ISBD, ISDS, AACR2, Language Codes ISO 639:1988, Country Codes ISO 3166, ISO 2709 format, etc. for data input and other

functions. It has inbuilt Barcode software also to generate and print barcodes for items and members.

The modules in SOUL are as follows
➢   Administration
➢   Acquisition
➢   Catalogue
➢   Circulation
➢   Serials Control
➢   OPAC and WEB OPAC

Features of Software for University Libraries (SOUL)
Some features of Software for University Libraries (SOUL) are;
➢   Client-server based architecture,
➢   User-friendly interface that does not require extensive training;
➢   Supports multi-platform for bibliographic database such as MySQL, MS-   SQL or any other RDBMS;
➢   Supports cataloguing of electronic resources such as e-journals, e-books, virtually any type of material;
➢   Supports requirements of digital library and facilitate link to full-text   articles and other digital objects;
➢   UNICODE-based multilingual support for Indian and foreign languages;
➢   Compliant to International Standards such as MARC21, AACR-2, MARCXML;
➢   Supports online copy cataloguing from MARC21-based bibliographic database;
➢   Provides default templates for data entry of different type of documents. User can also customize their own data entry templates;
➢   Provides freedom to users for generating reports of their choice and format along with template and query parameters;
➢   Supports ground-level practical requirements of the libraries such as stock verification, book bank, maintenance functions, transaction level enhanced security, etc.;
➢   Provides facility to send reports through e-mail, allows users to save the reports in various formats such as PDF, Excel, MARCXML, etc.;
➢   Highly versatile and user-friendly OPAC with simple and advanced search;
➢   Provides simple budgeting system and single-window operation for all major circulation activities;
➢   Online software update;
➢   Affordable cost with strong institutional support

2.1.2 Visionary Technology in Library Solutions (VTLS)

Visionary Technology in Library Solutions (VTLS), Virginia, USA based company developed a comprehensive integrated library automation software. VTLS has brought out a number of products now VALET is popular library management software better known as digital library software. It has Virtual Integrated Library Management Software. It has been developed on Windows and UNIX platforms. In addition to the standard ILS modules, acquisitions, cataloging, circulation, and serials control, VTLS will provide a number of customized solutions to manage library better. It has features such as InfoStation (Web based); Ad Hoc Profiler (parameterization tool); Z39.50 OPAC; Interlibrary Loan (ILL); 3M Self-Check Interface; etc. *(VTLS Inc., 2006).*

2.1.3 Mandarin

Mandarin announces the release of M5, a modern online catalog, fully web based, and the first of many updates in development. Like previous versions of Mandarin, M5 provides access to library resources from any workstation, at the library or remotely. M5 helps single libraries, libraries with multiple sites and school districts lower costs and save time with one-point installation, maintenance and updates.

2.1.4 LIBSYS

Libsys is a modular web-based library automation system**.** It is an Integrated Library Management Software package designed and developed by Libsys Corporation, New Delhi. It covers all the activities concerned with library management like acquisition, circulation, cataloguing, serial control, article indexing, abstracting, OPAC.

3.2   Open-Source Integrated Library Systems

Open source ILSs refers to a program in which the source code is available to the general public for use and/or modification from its original design free of charge. It allows users to modify the program according to need and to develop new code that improves the application. This technique helps to provide better quality software's having higher reliability, flexibility with lower cost. It is available free for download on the Internet. The examples of Open Source ILSs include:
1.   KOHA
2.   NEWGENLIB
3.   EVERGREEN

3.2.1 KOHA

KOHA is the first open source software library automation package. It was developed in 1999 by Katapo Communication Ltd in New Zealand for Horowhenua library trust and first implemented in January 2000. It is currently maintained by a team of software providers and library technology staffs around the world. In use worldwide, its development is steered by a growing community of users collaborating to achieve their technology goals.

The KOHA ILS includes catalogue, OPAC, circulation, member management, and acquisitions package. KOHA is used by public libraries, private collectors, academic libraries not-profit organizations, churches, schools, and corporate. To install KOHA for use following configuration is required. It requires a Linux server, apache, MySQL, Perl, Root on the server, a reasonable level of command with command line and database administration skill. Paul Poulain had begun adding multiple language support to KOHA in 2001.KOHA is available in several languages viz. English, French, Chinese, and Arabic etc. An Ohio based company LibLime was established in 2005 to support KOHA. It supports the international bibliography records and cataloguing standards MARC21, UNIMARC, Copy Cataloguing and Z39.50. It runs on different platform like Linux, MacOSx, FreeBSD, Solaris, and Windows. Originally developed on the Linux OS, is written in Perl, uses Apache web server, has better support for multi-RDBMS like MySQL, PostgreSQL. OPAC interface is in CSS with XHTML. KOHA-3.x supports Zebra full text search engine as backend, in addition to MySQL / PostgreSQL. **KOHA Software**

The KOHA is the first open source software that has full Integrated Library System (ILS) features. Its development started in 1999. KOHA Software is founded by a group of libraries in New Zealand that discover that proprietary software is expensive and lacks some features needed for library operations. KOHA Software has been translated into different language for easy use and accessibility. KOHA Software modules cover

- Circulation
- Patron: check / view users activities (Checking out items ,reserving, overdue   fines and registration of users
- Cataloguing
- Serials
- Reports: An accounts module for every KOHA modules
- KOHA Tools: Administration tools for modification

Features of KOHA Software
The features **KOHA Software are;**
➢ Has full features of Integrated Library System
➢ We based interface
➢ Web based OPAC system

- No vendor
- Easy for conducting search by all users
- Print barcodes
- Copy cataloguing and Z39.50
- Enables modification and update in circulation, cataloguing\
- A full acquisitions module complete with budgets, book funds, suppliers and exchange rates. Simple acquisitions for the smaller library.
- Circulation: a fully featured circulation with circulation rules customizable to needs of your library.
- An OPAC: the public side of KOHA. This has all the features you would expect, plus enhanced content from sources like Amazon, Google Books, etc.
- Flexible reporting: you have access to all the data in the database and a reporting engine is provided to help you query it.
- Customizable item types: you can choose exactly how you want to catalogue your items. This flexibility also allows KOHA to be used to manage inventory such as cameras or computers.
- Able to catalogue websites as items, or have them as links to existing records.
- Barcode scanning: KOHA works in a web browser, so any scanner that works with your PCs can be used with KOHA.
- Barcode printing: KOHA can be used to print barcodes and spine labels.
- User management: KOHA manages your users, including integration with systems like LDAP, Radius, Active Directory and SAML, to allow single sign-on.
- KOHA uses a full text indexing engine to allow for fast and powerful searching of all of your metadata.
- Mature support for all major library standards including MARC21, UNIMARC, Z39.50, SRU/SW, SIP2 and many more.
- Automated overdue notices either by email or SMS. KOHA can also send advance notices to warn a borrower that an item is nearly due. KOHA can email issue slips instead of printing them at point of circulation.
- KOHA can work in consortia, multi-branch or single-branch mode.
- KOHA has been translated into many languages including Te Reo Māori.
- KOHA has an offline circulation module.
- Self-Check: KOHA can be used with any SIP2 compliant self-check machines.
- Faceted search: Search results are classified for easier drilling down.

3.2.2 NEWGENLIB

NewGenLib is library automation software. It was developed by over a 4-year joint effort between professional charitable trusts, Kesavan Institute of Information and Knowledge Management (KIIKM) and a software development company Verus Solutions Pvt Ltd (VSPL), both in Hyderabad in India. It was developed in March 2005. It was totally proprietary library software but 9th Jan.2008, it was declared as open source software under GNU GPL v3 License. It has abilities a library manage its housekeeping operation, viz., acquisition of book and other materials creation and maintenance of its catalog database, circulation of its holdings, etc. NewGenLib allow library to define its own network of libraries. One library in the network called Host library install the software on its public domain server and then configures other libraries as Associate libraries on its network. NewGenLib can be installed on Linux and Window operating system. It has Compatibility - Complies with international metadata and interoperability standards: MARC-21, MARC-XML, z39.50, SRU/W, OAI-PMH

Main Features
- Functional modules are completely web based. Uses Java Web Start Technology.
- Compatibility - Complies with international metadata and interoperability standards: MARC-21, MARC-XML, z39.50, SRU/W, OAI-PMH.
- OS independent - Windows and Linux flavors' available and Uses chiefly open source components.
- Easily extensible to support other languages and Data entry, storage, retrieval in any (Unicode 3.0) language.
- Z39.50 Client for federated searching.
- Supports multi-user and multiple security levels and Allows digital attachments to metadata.
- Networking – Hierarchical and Distributed networks.
- Scalable, manageable and efficient.
- RFID integration.
- Automated email/instant messaging integrated into different functions of the software.
- Form letters are configurable and use XML-based Open Office templates.
- Extensive use of set up parameters enabling easy configuration of the software to suit specific needs, e.g., in defining patron privileges.

3.2.3 EVERGREEN

The Evergreen Project develops an open source consortia quality ILS (integrated library system) used by over 1000 libraries around the world. The software, also called Evergreen, is used by libraries to provide their public catalog interface as well as to manage back-of-house operations such as circulation (checkouts and checking), acquisition of library materials, and (particularly in the case of Evergreen) sharing resources among groups of libraries. The Evergreen Project was initiated by the Georgia Public Library System (GPLS) in September 2006 to support Public Information network for Electronic services (PINES). Equinox Software is the company that provides support, development, migration service and other service for library using evergreen.

Main features:
- Evergreen is a metadata search engine.
- Evergreen is a transaction processing engine.
- Evergreen is just another web application.
- Evergreen is based on a robust, scalable, message-passing framework – Open SRF.
- Search the collection.
- See the details of the records as well as their availability.
- Reserve items.
- Request for check-out
- View their transaction history
- View their current check outs and also renew them
- View their current reservations and also cancel them
- View their current requests for check-out and also cancel them
- List of new arrivals
- Login using their Library card number/Email id

3.2.3 Computerized Documentation Service/Integrated Set of Information System (CDS/ISIS)

CDS/ISIS is an integrated menu-driven software package developed by UNESCO in 1985. It is an information management system with numerical data elements stored in a database. A database is a file of related data collected and organised to satisfy the information needs of the a particular user community, It is used for creating manipulating textual databases Textual databases are well suited for bibliographic application which makes them ideal to be used for the catalogues in small and medium sized libraries.

The CDS/ISIS database contains files with which can be defined and manipulated in the following ways

i.   Display records
ii.   Entre new records
iii.   Define database
iv.   Correct, modify and delete records
v.   Retrieve records
vi.   Sort the records

Features of Computerized Documentation Service/Integrated Set of Information System (CDS/ISIS)
The features of Computerized Documentation Service/Integrated Set of Information System are as follows
vii.   Uses variable length text fields
viii.   Repeatable fields
ix.   Has sub-fields
x.   Uses inverted files to enable faster searching of the database
xi.   Functions in a multi- access environment
xii.   Free of charge
xiii.   Has multi-lingual version
xiv.   Uses indexing techniques

4.0 CONCLUSION

In this unit, you learnt about the proprietary and open source integrated library systems and some examples of each of these classifications. You also learnt some of the major features of these examples.

5.0   SUMMARY

This unit introduced you to one of the major classifications of integrated library systems, the classification by source code availability. This unit introduced you to proprietary and open source integrated library systems. The proprietary integrated library systems are licensed and commercial and their source codes are not free for downloads and customization. The open source integrated systems on the other hand have source codes that are free for download and customization.

6.0   SELF – ASSESSMENT EXERCISE

1.   What is proprietary Integrated Library System?
2.   Enumerate examples of proprietary Integrated Library System?
3.   Explain what you understand by the open sources Integrated Library Systems?
4.   Outline the examples of Open Sources Integrated Library System.

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MODULE 4   COMPETENCES/SKILLS AND CRITERIA FOR SELECTING INTEGRATED LIBRARY SYSTEM

INTRODUCTION

You learnt about Integrated Library System in the previous module. In this module, you will learn the requisite skills/competences needed to navigate and operate Integrated Library Systems. You will also learn criteria for selecting Integrated Library Systems, how they are evaluated to clearly show return on investments and current and future trends in the development of Integrated Library Systems.

Unit 1   Integrated library System Skills and Competences
Unit 2   Criteria for Selecting and Evaluation of Integrated Library Systems
Unit 3   Current and Future trends in the development of Integrated Library Systems

UNIT 1   INTEGRATED LIBRARY SYSTEMS SKILLS AND COMPETENCES

CONTENTS

1.0   Introduction
2.0   Intended Learning Outcomes (ILOs)
3.0   Main Content
       3.1   Integrated Library Systems Skills/Competences
       3.2   Other Core Technology Competences
4.0   Conclusion
5.0   Summary
6.0   Self – Assessment Exercise
7.0   References/Further Reading

1.0   INTRODUCTION

Welcome to this unit, this unit will introduce you to the skills and competences needed to effectively use and navigate integrated library systems. It will also introduce you to other core technology competences that will also aid the use and navigation of this integrated Library System.

2.0   INTENDED LEARNING OUTCOMES (ILOs)

By the end of this unit, you will be able to:

1.   Identify Integrated Library System competencies skills.
2.   Explain the Software Application competences,
3.   Understand the Hardware competences and the Operating Systems competences skills needed in Integrated Library Systems
4.   Explain the Web technology competences skills that will enable the effective utilization of integrated Library System.

3.0   MAIN CONTENT

3.1   Integrated Library Systems Skills/Competences

An Integrated Library System is a computer-based system used to manage internal and external resources including tangible assets, financial resources, materials, and human resources. It is built on a centralized database and normally utilizes a common computing platform and consolidates all library operations into a uniform and enterprise wide system.

Now that technology has permeated all levels of the library's operations and services, every position requires some level of comfort with computers. Providing Administration and support of the library automation system (ILS) and understanding the dependencies and workflows among systems are critical to maintaining a functional computing environment. The followings are the Integrated Library System Skills and Competences a staff must demonstrate   advanced understanding of the integrated library system (ILS) through:

- Articulating the value and purpose of a library automation system.
- Developing effective working relationships with others involved with the ILS, including internal library staff, ILS vendor support and ILS user groups.
- Understanding the interrelationships and workflows of the various modules of the library's automation system (OPAC, circulation, cataloging, etc.)
- Using of standard or customized reports from the automation system for management of library operations.
- Establishing procedures to ensure current back-ups and regular updates to the automation system; schedules overnight procedures and processes.
- Ensuring process for maintaining a log of system failures and problems

- Performing regular evaluations of the systems and communicates with the vendor on failures, problems and services.
- Demonstrating familiarity with operating and database systems used by the ILS.
- Understanding and can articulate the functions of Software as a Service (SaaS) and other hosting arrangements.
- Pursuing integrated e-book discovery and lending as part of the ILS

1.2   Other Core Technology Competences

The skill set required to be comfortable with integrated library systems cuts across four strategic areas:

1.   Software Application competences,
2.   Hardware competences and
3.   Operating Systems
4.   Web technology competences.

3.2.1 The Software Applications Competences are

1.   **Understands and performs basic functions and tasks of common software programs**
   - Identifies different types and uses of common software applications
   - Performs the manipulations common to most applications (open/close,   maximize, scroll, print, etc.)
   - Understands and uses the features common to most applications (menus,   toolbars, taskbar, Help menu, etc.)
   - Performs basic procedures to address software application problems
   - Demonstrates familiarity with tools and methods for making technology   more accessible for Users with disabilities.

2.   **Performs basic word processing operations**
   - Creates, opens and saves or deletes files
   - Selects, cuts, copies, pastes or deletes text
   - Performs operations to structure, format and spell-check documents

3.   **Performs basic printing operations from common applications**
   - Identifies printers available for a given workstation
   - Identifies local versus networked printers
   - Adjusts the set---up, previews print jobs and performs print operations

3.2.2 Hardware Competences

1. **Understands, uses and helps others use basic computer hardware and peripherals**
    - Understands basic technology terminology
    - Recognizes and understands the functions of basic computer components (computer, monitor, keyboard, mouse, power supply, printer)
    - Performs basic operations on computer hardware (plug in, start---up, shut---down, reboot, mouse functions, keyboard functions, uses headphones and speakers)
    - Recognizes common removable storage devices (CD or DVD disks, USB drives, floppy disks) and identifies the appropriate drives
    - Performs basic troubleshooting procedures for computer hardware and peripherals • Understands the set---up and use of data projectors and other audio---visual equipment used for library programming
    - Performs basic printer maintenance tasks (start-up, load paper and cartridges, clear paper jam)
    - Demonstrates familiarity with the library's assistive and adaptive technology and helps others learn to Use it
    - Demonstrates familiarity with library scanners and helps others use them

2. **Understands, uses and helps others use mobile devices**
    - Demonstrates familiarity with the use of e-reader devices and downloading of e- books
    - Demonstrates familiarity with other mobile devices in use in the library, including tablets and smart phones
    - Assists patrons to find answers to their questions about device usage
    - Assists patrons who want to print from their own devices to the library's wireless---enabled printers

3.2.3 Operating Systems Competences

Understands and performs basic operating system functions
- Performs basic operating system functions (logs on/logs off, launches programs from the desktop or menu, uses multiple open windows, deletes files)
- Performs common file and folder management tasks and recognizes common file extensions
- Performs basic computer maintenance tasks (e.g., empties "trash" or "recycle bin," restores files from trash, runs virus checks)

3.2.4 Web Technology Competences

Maintains awareness of commonly used technologies and applies technology effectively for on-going learning and collaboration

•   Uses technology as a tool to research, organize, evaluate and communicate   information
•   Uses digital devices, communication tools and social networks to access, evaluate and create information
•   Uses technology to share information, communicate and collaborate with others
•   Uses Web conferencing programs for synchronous, online meetings or learning
•   Identifies and uses help menus, tutorials and support communities to acquire the necessary skills
•   Locates and follows information sources to stay informed of new technologies and social tools.

4.0   CONCLUSION

In this unit, you learnt about the skill sets and competences needed to effectively navigate and use integrated library systems. You also learnt about other core technological competences that you will need to use integrated library systems.

5.0   SUMMARY

This unit introduced you to the skills/competences needed to effectively navigate and use integrated library systems. Knowing how to navigate and use the various modules on the integrated library systems and understanding the interrelationships and workflow between the subsystems on the integrated library systems are part of these skill sets. This unit also introduced you to other core competences required to effectively use these integrated library systems; competences associated with software, hardware and core web technology.

6.0   SELF – ASSESSMENT EXERCISE

1.   Outline the competences skills need in an Integrated Library System?
2.   Explain the Software Application competences skills?
3.   What are the Hardware and the Operating Systems competences skills needed in Integrated Library Systems?
4.   Explain the Web technology competences skills that will enable the effective utilization of integrated Library System?

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UNIT 2   CRITERIA   FOR   SELECTING   AND EVALUATION OF   INTEGRATED LIBRARY SYSTEMS

CONTENTS

1.0   Introduction
2.0   Intended Learning Outcomes (ILOs)
3.0   Main Content
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4.0   Conclusion
5.0   Summary
6.0   Self – Assessment Exercise
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1.0   INTRODUCTION

You have learnt what Integrated Library System is all about a computer-based system used to manage internal and external resources including tangible assets, financial resources, materials and human resources. It is a common computing platform that consolidates all library operations into a uniform and enterprise wide system. In this unit, you will be taught the general criteria for selecting software and Integrated Library System. This will include also steps for evaluating Integrated Library Software.

2.0   INTENDED LEARNING OUTCOMES (ILOs)

By the end of this unit, you will be able to:

- Identify criteria for selecting software
- Identify the criteria for selecting Integrated Library System in use
- Explain the preliminary Steps for Evaluation of software.
- Discuss the parameters for Evaluation of software.

3.0   MAIN CONTENT

3.1   General Criteria for Selecting Software

The following are the general criteria for selecting software:

1.   User Experiences
2.   Cost:
3.   Developer
4.   Supplier

3.1.1 User Experiences

A well tested package that is established in the marketplace, with several applications, is generally to be preferred. Such a package will be less likely to have bugs and should have adequate support. Other people's experiences are useful in indicating the potential and problems of a software package.

3.1.2 Cost

Cost is clearly a consideration, but since, in general, you get what you pay for, cost should not be a primary consideration. Software cost may also be a small component of the costs of the entire system, and better software may significantly reduce operating costs. Annual maintenance cost and revised version of the package must be kept in mind at the time of cost consideration, so that it gives compatibility with present and future systems.

3.1.3 Developer

The reputation of the developer responsible for writing a software package is important to consider. Experience with other packages from the same developer is useful in assessing a new package.

3.1.4 Supplier

With specialist software the supplier is often the developer, but with standard business packages there is often an agent acting as supplier. The user may look to the supplier for support and needs to feel confident that this will be forthcoming. The supplier's reputation and history should be considered. Supplier should provide training in the use of the program. Ease of availability of maintenances engineer should be kept in mind. Even though the software package is best, the system sometimes fails without timely and proper customers support in maintenance.

3.2   Criteria for Selecting Integrated Library   Systems

The following are some of the criteria for selecting Integrated Library Systems
1.   Cost
2.   Supplier Longevity
3.   Services
4.   System support and maintenance
5.   Copyright & Licensing Considerations

3.2.1. Cost

This is a very important factor to be considered before selecting library software. The cost of commercial software package varies considerably across the range of packages available except open source and free software. Most of the library automation software is costlier. Commercial software has initial purchase fees, licensing fees as well as up-grade fees. Moreover, the software designers also claim additional charges for customization, on-site training and data conversion from other DBMS / data sources, annual maintenance contract and customer support service. But the software developed locally might be cheaper price in comparison with foreign software. Some software package developed using open source and free software is available free of cost and offer only on the distribution charge. Facts to be considered under cost as one of the factors are as following:

- Are the license costs justified given the functionality offering?
- Is the required database affordable?
- Are annual maintenance charges reasonable?
- What is ratio of software costs to the implementation cost?

3.2.2 Supplier Longevity

Supplier longevity is also very important factor to be considered before selecting the software that the numbers of years has the company been actively engaged in this software industry, when was the product's first released and what is the current release version being quoted. The reliability, customization and durability depend on the stability of the software designer and supplier. If the company has been consistency profitable year over year and the recent turnover has been on the management staff, there is no doubt on the company's longevity. Similarly, the costumer's reference is also supportive factor to take a decision.

3.2.3 Services

The most important factor is the service part of any software package for the library, because the library. The librarian can serve the people effectively, efficiently as well as rapidly with the help of automation using good library software package which is integrated by all required services.

3.2.4 System support and maintenance

Especially the training, maintenance and documentation are included in the customer support services. It also includes publications (e.g. manual

and newsletter) which contain information about latest development of the software. It helps to keep the users up to date in the latest development of the library software.

Some areas where the software developer gives support include:

i)   **Training**
     The training of the library staff in computer operation is of vital importance. Every library staff member should be given a training and orientation about the computer system. The responsibility of the software designer or supplier does not end by selling the software without training until and unless the people learn entire operations of the software. Because the most important people in making library computerization successful are librarians. It must be realized that librarians will not be able to make any use of computer equipment until they are provided with the know-how required to use it. So, it is necessary to make training arrangements for the professional development of librarians.

ii) **Maintenance**
     One should examine very carefully the support and maintenance arrangements being offered by the vendor/ supplier. Maintenance may include removing the bugs or errors that might become evident in the software as it is used for a greater variety of applications and improving the software. Regarding maintenance, following things should be in mind in the software selection process:
     •   Does the software have De-bugging facility and scope of proper   error message while executing the software?
     •   How quick is non-critical software bugs fixed for the upgrading the software to adopt new technology?
     •   Is there any supplier for annual maintenance contract in discounted rate?

iii) **Documentation**
     The reference manual with detailed written instruction (step by step) is necessary for using software package after training programme. The language of the manual should be easy to understand and should have a table of contents, glossary and index. It is also important to know whether they have any regular newsletter or user information up-date publication regarding the library software.

i)   **Performance**
     Provision of searching the OPAC and web simultaneously (Meta search) using a single word search, search response time, search

options, back-up facilities, database security etc. shows the performance of any library automation software. The functions of packages are inter-related each other. The response time of the search module depends on different factors, such as file organization, operating system, hardware platform, numbers of records in database, etc.

v)   Search Options
The search option includes simple search, Boolean search, (AND, OR, NOT) Advanced search, string search, keyword search, field limitation search, truncation, use of related terms in searching. Provision of multiple manipulations and adequate searching capabilities must be in good characteristic software.

vi)   Security
Security mechanism prevents the software from misusing database by the users and other people. For the safety purpose, the software should have following things:
- Provision of user id /barcode etc.
- Provision of access restriction to certain records/ fields.
- Provision for students and staff to log in and log off on their own
- Modification/ new version of the software obtained by the librarian

vii)   User Friendliness
The system should be easy to use and check whether the system empowers the experienced user with short cut and flexible tool. The system should be easy to learn, menu driven and command mnemonic based. Besides the above criteria, copyright & licensing consideration is also important for evaluation of software.

3.2.5 Copyright & Licensing Considerations

All commercial software is copyright protected. The purchased package will contain a licensing statement to which the purchaser agrees by the action of opening the package. An advantage of the licensing agreement is that a registered owner (registration cards are also included in the software package) can usually obtain upgrades at far less than the full market price. Free software is not copyright protected. Usually referred to as "Public Domain Software," such packages are freely copy-able and/or transferable.

3.3 Preliminary Steps for Evaluation of Software

The following are the preliminary steps for evaluation.
1. **Consult others:** You don't want software that stops unexpectedly, slows down on large network, report error message, so consult with other who has already used the software in the same way you intend to use the system or consult other who have already experienced on that software.
2. **Referee**: The reputation of person or the institution, his/her experienced on that particular software should also be justified at this point.
3. **Reputation of the manufacture and vendor**: the reputation of the manufacturer and vendor should also be considered.

3.4 Parameters for Evaluation of Software

The following are some parameters for evaluating a Software package:

1) **Documentation**
   a) **Existing literature:** go for the software after carefully examining the existing literature and documentation on the particular software.
   b) **Training:** does the company or authority of the particular software provide training? Where and how the training is conducted, whether it is online, Onsite should also be considered.
   c) **Manual:** does the training is accompanied by easy to follow supporting print material or manual. How good the manual is?

2) **General features of the software**
   a) **Various computer platforms:** the various computer platform needed to run the software i.e. server, wireless connectivity, hard disc space needed etc.
   b) **Multiple platforms:** does the software able to run in multiple platforms such as windows 2000, windows N.T., windows98, 95 etc.
   c) s **Capacity:** The restriction in total number of database /information /records in a database it can handle effectively.
   d) **Speed:** Speed of operation in different environment.
   e) **Flexibility:** Flexibility to handle of records of variable sizes.
   f) **Standardize data format:** Does it use standardize data form for importing and exporting of data.
   g) **De-bugging facility**: De-bugging facility and scope of proper error message while executing the software.

3.   User friendliness:
   a)   Is the system easy to use?
   b)   Does the system empower the experienced user with shortcuts and flexible tools?
   c)   Is the system easy to learn?
   d)   Is the system menu driven? Are the commands mnemonic?
   e)   **Effectiveness**: Does the system meet the specification.
   f)   **Reliability:** Does the search give consistent result?
   g)   **Expandability:** Is the system permit addition
   h)   **Total cost of the software:** Does the system come in different module i.e. available in only circulation module, circulation plus cataloguing module. What is the total cost of the system?
   i)   Stream less movement of data: Does the database built on open standard technologies such as SQL, cold fusion, or XML that allows different types of software to talk to each other.
   j)   That means your different system of the software can easily and automatically shares and updates any information that have in common e.g. students name, address etc.

4.   Services
   a)   **Acquisition:** Does the system carry out duplicate checking while entering the data. Does it have the capacity to print accession register?
   b)   **Data entry and editing:** How effective the system is for data entry? Is the software provides easy way for editing of records? Is insertion and deletion of records are easy?
   c)   **Circulation:** provision of facility for issue, return, computation of fines, reservation of document etc.
   d)   **Serial control:** Provision of monitoring multiple issue of a serial, provision of grace period for receiving the serial , provision of renewal, overdue alert, entering the abstract of a serial.
   e)   **OPAC:** Provision of reservation through OPAC, provision of searching OPAC from outside the library, provision of searching the OPAC and web simultaneously (Meta search) using a single word search.
   f)   **Library administration**: The software should allow generating different reports i.e. collection statistics, circulation statistics and also should be helpful to create your own specialized report to meet your specialized need.
   g)   **Enhanced MARC data**: Many software allows to catalogue website, E-Books, AV resources in addition to

the library resources. These websites are added by the library media specialist manually.

h) **Updating**: Does the library automation system company from their own site help to install, upgrade (web based updates), and patches or simply to help you with a particular function.

5   New technologies:
a)   Provision of handling un catalog item
b)   Provision of internet connectivity, E-Mail connectivity.
c)   Scope of integration of the software with other school department.
d)   Provision of accessed the software from computer outside of the school walls via a web browser.
e)   Does the library software keeping pace with global technology, web enhancement, online information, virtual services etc.
f)   Many latest software is nowadays hosted by a vendor by an Application Service Provider (ASP) or by the school web server. This is an advantage, here cataloguer can work from remote location and OPAC can be accessed from both home and school, 24 hours a day.
g)   Can other application besides library software run on the workstation?
h)   Can the software makes it easy to switch between the OPAC and writing station because there are times when you like that your public OPAC station to function as writing station and there are other times when you like the writing station to becomes function as OPAC.

6   Security
a)   Provision of user id /barcode etc.
b)   Provision of access restriction to certain records/ fields.
c)   Is there any provision for students and staff to log in and log off on their own?
d)   How new modification/ new version of the software to be obtain by the librarian?
e)   **Power out feature**: Is there any power out feature included? There should be a manual hand scanner available to check material in and out that can easily be connected to the computer system once its back up and running.
f)   **Future exist cost**: In near future if you want to switch over to another packages then the cost involved in such cases should also be consider.

7   Post installation
     a)   Does the vendor give performance/ service warranty?
     b)   Post installation support from the vendor.

4.0 CONCLUSION

In this unit, you learnt about the criteria for selecting software. You learnt for example about the need to take cost supplier and user experience into consideration when selecting software. You also learnt criteria for selecting integrated library software. You also learnt about preliminary steps for evaluating integrated library systems and the parameters for evaluating them.

5.0   SUMMARY

This unit introduced you to the general criteria for selecting software; issues like user experience, cost, developer, suppliers should be considered before software is selected for use. This unit also introduced you to criteria for selecting integrated library systems like supplier longevity, system support and maintenance, cost etc should be considered before libraries select ILSs. The preliminary steps for evaluating integrated library systems include consultations of others who have implemented the integrated library system, the referee who recommended the system and the reputation of the developer of the system. This unit also introduced you to parameters for evaluating integrated library systems.

6.0   SELF – ASSESSMENT EXERCISE

1.   State the criteria for selecting software?
2.   What are the criteria for selecting Integrated Library System?
3.   Explain the preliminary Steps for Evaluation of Library Software?
4.   Discuss the parameters for Evaluation of Library Software?

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UNIT 3   CURRENT AND FUTURE TRENDS IN THE DEVELOPMENT OF INTEGRATED LIBRARY SYSTEMS

CONTENTS

1.0   INTRODUCTION

You have studied the Integrated Library System and the criteria for selecting and evaluating software packages for the library. In this unit I will be introducing you to the current and future trends in the development of Integrated Library System.

2.0   INTENDED LEARNING OUTCOMES (ILOs)

By the end of this unit, you will be able to:

- To identify the current and future trends in the development of Integrated Library.
- Discuss the various current and future trends in the development of Integrated Library.

3.0   MAIN CONTENT

3.1   Current and Future Trends in the Development   of Integrated Library Systems

The following are the cutting-edge technologies that are going to influence the processes, procedures, architectures and platforms for future integrated library systems design:

1.   Service-oriented Architecture (SoA) in ILS
2.   Service-oriented Architecture (SoA) in ILS
3.   Linked Open Data (LOD)
4.   Web-Scale Library Management

5.   Web 2.0 Compliant ILS
6.   Information Mashup

3.1.1 Service-oriented Architecture (SoA) in ILS

Service-Oriented Architecture (SOA) is an ICT architectural style that supports seamless flow of information, which is independent of systems, platforms, software architecture, data structures etc. It indicates a way of thinking in terms of services, service-based development and the outcomes/deliverables of services. SoA is now established as a mature architectural style and the ILSs have started switching to this promising architectural style to provide end users innovative library services and opportunities for other libraries to utilize resources and services (through application program interface). The SoA is an essential attribute of an ILS to support Cloud Computing. It facilitates the effective use of the Cloud.

3.1.2 Cloud-Based Library Automation

Cloud computing is network based computing facilities that support on-demand   use of hardware and software resources. Libraries can take advantages of cloud computing in the following ways:

i)   Using ILS available in remote server through web browser without any   installation;
ii)   Hosting the Web-OPAC and staff interfaces in remote server without burden of local management of server and arrangement of IP address and domain name;
iii) Setting up own remote file storage and database system (with scheduled backups).

The cloud computing mainly supports three facilities. These are Infrastructure as a Service (IaaS), Platform as a Service (PaaS) and Software as a Service (SaaS).

The Cloud based library automation has following advantages:
i)   Resource pooling (cloud computing providers provides a vast network of servers and hard drives for use by client libraries);
ii)   Virtualization (libraries do not have to care about the physical management of hardware, software, user interface, data backup and hardware compatibility);
iii) Elasticity (addition of storage space on-demand in hard disk or increasing server bandwidth can be done easily);
iv)   Geographical scalability (cloud computing allows libraries to replicate data to several branch libraries world-wide);

v)   Automatic resource deployment (libraries only needs to choose the types and specifications of the resources required and the cloud will configure it automatically);

vi)   Metered billing (library will be charged for only what they use). As a whole cloud-based library automation is quite useful and cost effective for small and medium sized libraries. Large-scale libraries may offer datasets on the cloud for use by small libraries (Data as a Service (DaaS)).

3.1.3 Linked Open Data (LOD)

Linked Open Data (LOD) refers to publishing and connecting structured data on the Web for use in public domain. The three Key technologies that support LOD are: URI (Uniform Resource Locator, a generic means to identify entities or concepts in the web), HTTP (Hypertext Transfer Protocol, a simple yet universal mechanism for retrieving resources, or descriptions of resources over the web), and RDF (Resource Description Framework, a generic graphical data model to structure and link data that describes things in the web). Linked Open Data (LOD) has two basic purposes:

i)   Publish and link structured data on the Web; and
ii)   Create a single globally connected data space based on the web architecture.

Tim Berners-Lee advocated four rules for converting dataset to LOD. These are:

1)   Use URIs as names for things
2)   Use HTTP URIs so that people can look up those names;
3)   When someone looks up a URI, provide useful information, using the standards (RDF, SPARQL); and
4)   Include links to other URIs, so that they can discover more things.

3.1.4 Web-Scale Library Management

Web-scale library management service is essentially, a cloud based solution developed by OCLC. In this service OCLC member libraries are not only getting shared computing infrastructure but also shared data from WorldCat. OCLC is successfully mixing four basic elements of cloud computing i.e. IaaS, PaaS, SaaS and DaaS (see cloud computing section above). There has been a change in trends of library automation. It is no longer about which library provides the largest collection but about which library can provide their community with the best means to access the materials they need, regardless of location (OCLC, 2011).

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Libraries can increase visibility at the global scale and accessibility to services at the wider scale by using the new Web-scale library management facility.

3.1 5 Web 2.0 Compliant ILS

The present web (often referred as web 1.0 in blog sphere) is progressing towards a User-centred entity with the support of an advanced set of technological tools that are collaborative, interactive and dynamic in nature. ILSs are all set to take advantages of participative architecture of the web and introducing new services like user tagging of subject descriptors, ratings of documents by users, RSS feed for search query, integration with web 2.0 services like read/write web, collaborative web, social networking tools and information mashup. This new trend ILS is also termed as ILS 2.0.

3.1.6 Information Mashups

Information mashups tools allow remixing of data, technologies or services from different online sources to create new hybrid services (O'Reilly, 2005) through lightweight application programming interface (API). ILS uses information mashup in managing and integrating virtual contents distributed globally with local library resources. Information mashups are becoming popular application of Web 2.0 around the world such as KohaZon (integration of Koha OPAC with Amazon services), WikiBios (a mashup where user can create on-line biographies of each other in a Wiki setup), LibraryLookup (integration of Google maps with library directory service in UK) and many more such instances.

4.0   CONCLUSION

In this unit, you learnt about the current and future trends in the development of integrated library systems. For example, you learnt about issues of service oriented architecture, cloud computing, linked open data etc and how libraries will benefit from these innovations.

5.0   SUMMARY

This unit introduced you to current and future trends in the development of integrated library systems. This unit introduced you to innovations like service oriented architecture, cloud computing, information mashups, linked open data and how they can be harnessed in the development of integrated library software and how libraries can benefit from these trends.

6.0   SELF – ASSESSMENT EXERCISE

1.   Explain the term Service-oriented Architecture (SoA) in ILS?
2.   Discuss the term Service-oriented Architecture (SoA) in ILS?
3.   What do you understand as Web-Scale Library Management?
4.   Explain Web 2.0 Compliant ILS?
5.   What is Information Mashup?

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