ICT INFRASTRUCTURE & SERVICES IN THE LIBRARY

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Abstract : *Any individual in a society can significantly increase their knowledge power by attending college. Academic libraries are not limited to printed sources of information; in fact, they have begun to acquire and handle digital, electronic, or virtual information resources. Hence, by offering a variety of printed or digital materials, college libraries are able to meet the needs of students, professors, and researchers. Information and communication technology (ICT) combined with qualified and skilled library staff can provide better and more efficient library services. ICT's technological component hasn't presented many difficulties for college libraries.The obtain information of concept of ICT infrastructure & types of ICT infrastructure,To obtain information about the hardware & Software infrastructure facilities in the college libraries.To obtain of ICT.To obtain information about the ICT infrastructure Management. information about the internet facilities in the college libraries. To obtain about the ICT based library services performed by the college libraries.To obtain information about Barriers associated with the implementation.*

Key-Words : *ICT,ICT Infrastructure, Traditional infrastructure, Cloud infrastructure, Hyperconverged infrastructure , Hardware Infrastructure,Software Infrastructure, ICT Based Library Services OS management.*

Introduction :

A library is the hub of a facility that gathers, preserves, and disseminates up-to-date knowledge to educators, learners, researchers, and other professionals. The standard of services offered by the academic library determines the calibre of an academic institution. Any academic institution's beating heart is its academic library. The importance of college libraries in advancing the knowledge and abilities of academic students in both rural and urban settings is significant. The term "information and communication technology" (ICT) refers to any set of devices and processes that make it easier to gather, store, search for, retrieve, and transmit information. It radically alters how information is accessed, stored, and disseminated and makes the world more connected and speeds up information flow. ICTs provide enough opportunities.

Review of Literature :

In the area of ICT infrastructure in libraries, a lot of work has been done. Hence, prior to undertaking the research study, these linked studies on ICT infrastructure and services were consulted. Below is a brief overview of a few of these linked studies:

Atonring (2015) has conducted a study on ICT in the university libraries of Tamil Nadu which mainly focuses on how far the university libraries have adopted the modern techniques for library management and availability of ICT infrastructure among Arts and Science university libraries in Tamil Nadu.

Egoeze et al., (2014) have carried out a descriptive study on ICT application and infrastructure in Nigerian Universities. According to the survey, there is a shortage of ICT infrastructure and low utilisation in Nigerian colleges. Computers, the internet, email services, the World Wide Web, websites, and telephones were found to be the primary ICT infrastructure and services used at Nigerian universities.

Mondal and Bandyopadhyay (2014) have performed research on the availability of ICT infrastructure in West Bengal's university libraries. It has been discovered that the ICT infrastructure in West Bengal's university libraries is still in various phases of development. The majority of West Bengal's university libraries have the bare minimum in terms of ICT implementation infrastructure.

Mahanta (2014) has researched the infrastructure of information and communication technology in the Assamese district of Barpeta's college libraries. In order to identify the hardware and software infrastructure facilities with the automation status in the college libraries, library services provided by the college libraries, and the constraint to use ICT in the college libraries, a study was conducted among the 14 college libraries in the Barpeta district. According to the report, ICT usage in the college libraries in the Barpeta district is still in its infancy. The majority of college libraries feature some kind of automation. Also, it has been noted that the majority of libraries have had issues implementing ICT in their college libraries due to a lack of funding.

Patil, Lihitkar and Lihitkar (2014) with the goals of determining the automation status, ICT infrastructure, library services through ICT, training need by library personnel with problems experienced in adopting ICT, etc., have studied on ICT applications on Agriculture University Libraries in western India. In western India, eight agriculture universities were examined. It was discovered that two university libraries had automated their collections to a full 100%, four had automated their collections to a full 75%, and the remaining two had automated their collections to a full 50%. The SDAU library has the most to a certain extent in terms of ICT infrastructure availability, while the BSKKV library has the least. Every university feels there are not enough ICT resources to meet user needs. It has discovered that 88.

Walmiki and Ramakrishnegowda (2009) have researched the ICT infrastructure present in university libraries in Karnataka to determine the state of the hardware, software, and other ICT infrastructure. The state of the ICT infrastructure in Karnataka's university libraries is assessed to be at a developing stage. The university libraries in Karnataka do not

yet have the necessary internet speed, appropriate computer hardware, or appropriate software.

Objectives :

Following are the main objectives of the study :

(i) To obtain information of concept of ICT infrastructure & types of ICT infrastructure.
(ii) To obtain information about the hardware& Software infrastructure facilities in the college libraries.
(iii) To obtain information about the internet facilities in the college libraries.
(iv) To obtain information about the ICT based library services performed by the college libraries.
(v) To study about Barriers associated with the implementation of ICT.
(vi) To study about the ICT infrastructure Management.

Research Methodology :

The study's research approach makes use of the methods of secondary data collection and observation.

Concept of ICT Infrastructure :

Information technology infrastructure is defined broadly as a set of information technology (IT) components that are the foundation of an IT service; typically physical components (computer and networking hardware and facilities), but also various software and network components.

According to the ITIL Foundation Course Glossary, IT Infrastructure can also be termed as "All of the hardware, software, networks, facilities, etc., that are required to develop, test, deliver, monitor, control or support IT services. The term IT infrastructure includes all of the Information Technology but not the associated People, Processes and documentation.

Types of ICT infrastructure :

i.Traditional infrastructure :

In a typical infrastructure, the firm manages and owns all of the equipment, including data centres, storage, and other items, inside of its own premises. Conventional infrastructure is frequently regarded as being expensive to maintain because it needs a lot of gear, such as servers, as well as electricity and physical space**.**

ii.Cloud infrastructure :

The parts and resources required for cloud computing are referred to as cloud infrastructure. Building your own private cloud with resources that are only available to you will enable you to do so. Alternatively, you can use a public cloud by renting cloud computing

resources from a company like Alibaba, Amazon, Google, IBM, or Microsoft. You can build a hybrid cloud by integrating some level of workload mobility, orchestration, and management across various clouds.

iii. Hyperconverged infrastructure :

You can control your computing, network, and data storage resources from a single interface thanks to hyperconverged infrastructure. By combining software-defined computation and data storage, you may serve more contemporary applications using scalable architectures and commercially available hardware.

Hardware Infrastructure :

Servers, data centres, personal computers, routers, switches, and other devices are examples of hardware. The infrastructure may also comprise the structures used to house, power, and cool data centres. The main necessity for library automation is hardware, and there are many different kinds of hardware on the market depending on a hardware specification;

- Available budget
- The amount of data to be stored.
- Usage volume
- Necessary speed.
- Upgradeable features when need.
- The accessibility of services (maintenance).
- Compatibility with the operating system that we'll be using.
- Warranty duration

Library Related Hardware :

Sr.No.	Hardware	Sr.No.	Hardware	Sr.No.	Hardware
1	Server	8	Scanner for General Purpose	15	RFID
2	Desktop	9	Scanner for Dizitization	16	Backup Divces
3	Laptop	10	Backup devices	17	UPS
4	Printer	11	Projector	18	Fax
5	Barcode Scanner	12	Identity card printer	19	Web Camera
6	Internet	13	CCTV		
7	Barcode Printer	14	Photocopy machine		

Software Infrastructure :

Software describes the business's software, including web servers, content management systems, and Linux-based operating systems. The OS establishes the connections between all of your software and the functional hardware and is in charge of managing system hardware and resources.

1. Operating System Selection of operating system depends on :

- Hardware compatibility
- Further supporting from operating system developers
- To be user friendly • Upgrade facility (service packs)
- Library automation software
- Supporting software's for library automation software.

2.Library Management Software :

Sr. No.	Software	Sr.No.	Software	Sr.No.	Software
1	Teachmint	12	Koha ILS	23	Destiny Library Manager
2	Academics	13	PLA Net Library Management	24	Codeachi Library
3	Alexandria	14	Smart Lib	25	Stylicious-Library Management System
4	Libraian	15	Library World	26	Mastersoft
5	Kooba Library	16	CloBas	27	Edumaat-Imagine Greatness
6	Eloquent	17	World Share Management Service	28	Schoolknot
7	Entab	18	Iolite School Management	29	Sanjay
8	Granthalaya Library Software	19	Libsys Library Software	30	SOUL
9	E-Granthalaya Library Software	20	Opals	31	PMB
10	Winisis Library Software	21	Open Biblio	32	Biblio Q
11	New Gen Lib Library Software	22	Invenio	33	

Digital Library Software or Institutional Repository Software :

Sr.No.	Software	Sr.No.	Software	Sr.No.	Software
1	DSpace	11	Archimede	21	IRPlus
2	Greenstone	12	Artudis	22	Islandora
3	Koha.	13	Daitss	23	KeyStone Digital Library Suite
4	Evergreen	14	Dienst	24	MOAI
5	BiblioTEQ	15	Enterprice	25	MyCoRe
6	OPALS	16	E-Prints	26	NITRC-R
7	Invenio	17	ETD-db	27	Weko
8	SLiMS	18	Extensible Text Framework	28	Omeca
9	FOLIO	19	Fedora	29	Opus
10	Peer Library	20	PubMan	30	Zenodo

Antivirus Software :

i)Bitdefender ii) Norton iii) Webroot iv) McAFee v) Trend Micro vi) Malwarebytes

Internet Connectivity :

Type of internet connection :

i)Mobile ii) WiFi Hotspot iii) Dial Up iv) DSL v) Wireless vi) Cellular

Type of internet service provider :

i)BSNL ii)Airtel iii) Reliance iv)Jio

Networking :

Interconnected network components enable network operations, management, and communication between internal and external systems. The network consists of internet connectivity, network enablement, firewalls and security, as well as hardware like routers, switches, and cables.Networking is required to interconnect the computers, computer peripherals, switches to share the information. The intension of the network is to distribute information among the interconnected users. The network mainly consist of three components i.e. transmission media, mechanism of control and interface unit to the network. Type of network is depends on requirement of the users or objective of the organization to provide the database access to the users.

i.Local Area Network (LAN) is useful to access the library database within the organization.

ii.Wide Area Network (WAN) is required to provide the access facility to outside of the organization.

iii.Cloud Network when we use the database on cloud.

ICT based Services performed by the Libraries :

- Online Database Services
- Electronic Database
- Institutional repository
- Document Delivery service
- Internet Service
- Photocopy service
- OPAC
- Lending Services
- CD-ROM
- Scanning facility
- Printing facility
- Desktop facility

Barriers associated with the Implementation of ICT :

- Inadequate training in ICT applications
- Lack of IT infrastructure and network facility
- Lack of support from authorities
- Lack of budget for ICT
- Lack of Co-ordination among library Staff
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- Lack of Co-ordination among library Staff
- Non availability of consultation services
- Lack of upgrading ICT strategy
- Lack of interest for learning ICT application
- Overload of work
- Erratic Power supply
- Lack of IT skilled manpower

ICT infrastructure Management :

ICT infrastructure management is the coordination of IT resources, systems, platforms, people, and environments. Here are some of the most common technology infrastructure management types:

OS management : Oversees environments running the same OS by providing content, patch, provisioning, and subscription management.

Cloud management : allows cloud administrators to manage resource deployments, use, integration, and disaster recovery, giving them control over everything that is running in a cloud, including end users, data, applications, and services.

Virtualization management : interfaces with actual hardware and virtual environments to improve data analysis, simplify resource management, and expedite operations.

IToperationsmanagement : Modeling, evaluating, and optimising business processes that are frequently repeated, continuing, or predictable is a method called as business process management.

ITautomation : develops repeatable procedures and instructions to eliminate or minimise human contact with IT systems. additionally referred to as infrastructure automation.

Container orchestration : Automates the deployment, management, scaling, and networking of containers.

Configuration management : keeps software, servers, and computer systems in a constant, desired state.

API management : application programming interfaces (APIs) that link apps and data across organisations and clouds are distributed, controlled, and analysed.

Risk management : identifies, evaluates, and develops plans to reduce or manage risks and their potential effects.

Data management : Gathers, stores, and uses data, allowing organizations to know what data they have, where it is located, who owns it, who can see it, and how it is accessed.

Conclusions :

The availability of the hardware and software infrastructure facility in the college libraries has reached a good condition, according to the data analysis of the study. Nearly all college libraries have functioning internet connectivity, and the majority of these libraries have been paying BSNL for their internet service. Most college libraries have internet and barcode technologies. The majority of college libraries now offer internet and photocopying facilities. The advent of ICT has presented various challenges for college libraries. The primary issues are brought on by a lack of IT competent workers and insufficient instruction in ICT applications. In India, the Rashtriya Uchchatar Shiksha Abhiyan (RUSA), the University Grants Commission, INFLIBNET, the relevant state government, and local businesses have been making enormous efforts to modernise the educational institutions. The colleges have seized the chances for each educational institution's growth and modernization. The college administration should allot as much money as possible to help the libraries overcome their challenges. According to UGC standards, the authority should take the initiative to hire trained library workers who are IT-savvy. To keep up with the most recent technologies, librarians and library personnel should enrol in ICT-based training programmes offered by various organisations.

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