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**Abstract**

Information technology serves as the foundational infrastructure that allows digital libraries to transcend the physical barriers of time and space. By integrating computer systems, high-speed telecommunications, and specialized software, digital libraries provide 24/7 universal access to organized collections of digital objects—ranging from digitized legacy texts to "born-digital" multimedia content. The shift is characterized by a move away from manual processing toward automated retrieval, sophisticated metadata indexing, and global resource sharing.

Keywords: Institutional Repository (IR), Cloud Storage, OAI-PMH, Handle System, Dublin Core, Taxonomy & Ontology, Born-Digital

Introduction

The integration of Information Technology (IT) into library science has redefined the concept of a library from a physical space to a globalized digital ecosystem. At its core, a digital library is a managed collection of information, with associated services, where the information is stored in digital formats and accessible over a network. Today, the field is moving toward Intelligent Digital Libraries. By leveraging Artificial Intelligence (AI) and Machine Learning, libraries are now able to provide personalized recommendations, automated translation, and "semantic searching," where the system understands the context of a query rather than just matching keywords.

Digital Libraries & Information Technology Definition

A digital library is an online collection of digital objects of assured quality that are created or collected and managed according to internationally accepted principles for collection development. These are supported by services necessary to allow users to retrieve and exploit resources in a coherent and sustainable manner efficient information exchange and collaboration across local and global environments.

Core Components of Digital Libraries & Information Technology**Theoretical Frameworks**

Modern digital library science relies on formal models to define how technology interacts with information and people.

- The 5S Framework: A widely accepted formal model that defines a digital library through five abstractions:
- Streams: Sequences of bits (text, audio, video) that form the digital content.
- Structures: The organizational logic, such as Metadata schemas or Hypertext links.
- Spaces: Logical and mathematical views, such as Vector spaces used in search algorithms.
- Scenarios: The sequences of events that define services like searching or browsing.
- Societies: The sets of human users and software agents (e.g., Web Crawlers)

Architectural Layers

Digital libraries utilize Client-Server Architecture divided into specific functional layers:

- Presentation Layer (User Interface): Provides gateways for both end-users (for discovery) and administrators (for curation).
- Service Layer (Middleware): Handles the "logic" of the library, including Index Services for searching and Handle Systems for providing permanent, location-independent identifiers to digital objects.

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- **Data/Repository Layer:** The back-end where bit-streams (files) and their associated metadata are stored. This often involves a Repository Access Protocol (RAP) to manage permissions and secure access

Key Technological Concepts

- **Interoperability:** The ability for disparate library systems to "talk" to each other. This is achieved via protocols like **OAI-PMH** (Open Archives Initiative Protocol for Metadata Harvesting), which allows one library to "harvest" and search records from another.
- **Digital Preservation:** Unlike simple backups, this involves Emulation or Migration strategies to ensure files remain readable as hardware and software formats become obsolete.
- **Semantic Digital Libraries:** Advanced systems that use Ontologies to understand the context of information, enabling machines to process relationships between different pieces of knowledge automatically.

Technical Architecture

Layer	IT Component	Function
Connectivity	High-speed Telecommunications	Facilitates the "transcendence of space" via Fiber Optics and 5G/Satellite networks.
Organization	Specialized Software	Uses Relational Databases and Inverted Indexes to replace manual card catalogs.
Accessibility	Client-Server Systems	Enables 24/7 access by hosting content on "always-on" cloud servers like AWS or Azure.

Conclusion

The marriage of **Digital Libraries** and **Information Technology** represents more than just a shift in storage—it is a fundamental evolution in how humanity preserves and accesses knowledge. By replacing physical stacks with **distributed networks** and manual catalogs with **AI-driven metadata**, IT has transformed libraries from passive repositories into proactive, global information hubs.

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Conflicts of interest

The authors declare that there are no conflicts of interest regarding the publication of this paper

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