Automation of Libraries, Generations, Features, Areas, and their Benefits in Digital Era

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Abstract:

Due to the explosion of information, librarians feel more difficult to acquire relevant documents for their readers. Now simultaneously increase in the user's demand and number of documents published forced the librarians to take up the task of systematic organization of the recorded knowledge enabling the easy retrieval of documents. Library Automation refers to the phenomenon of library activities such ac Acquisition, serial control, circulation, classification and cataloguing services and other related activities. This Paper mainly highlights for Definition, Meaning of Library automation, Objectives, Needs, Features, Advantages, Benefits, Disadvantages, Areas and Services of Library Automation, Criteria, Factors, Planning, Library Packages, Guide to Library automate systems, Library Software, Hardware & Consulting Companies**,** Challenges before Librarians of Libraries, Suggestions and so on.

Keywords/Descriptors:

Library Automation, Special Features, Benefits, Factors, Areas and Services of Library Automation, Library Packages, Guide to Automate Library Systems, Suggestions.

1. Introduction:

Information proliferation on the one hand and enormous growth in the volume of transactions on the other has led to the wide and extensive adoption of computers in library management. Many libraries and information centers have now employed computerized information systems and a large number are seriously planning implementation of computer based systems. Another development that has accelerated the rate of transition in libraries from manual to machine based systems is that increasingly libraries are becoming part of larger library networks to facilitate information exchange and resource sharing and with the objective of enhancing the quality of library service. Mechanism of library housekeeping operations predominantly by computerization is known as Library Automation. The appearance of computer has greatly increased the activities of library automation. In addition to computers advancement, telecommunication and audio-visual technologies gave way to new possibilities in information handling. However the use of computers is limited to only some specialized libraries unlike the case of developed countries. Library automation includes other semi-automatic because human intervention is greater in extent. Hence library automation principally the use computers, associated peripheral media, computer based products and services in library work. Efforts in automating library catalogues and designing automated text retrieval systems have largely been influenced by the availability of the CDS/ISIS software from UNESCO through the NISSAT. Increasing availability of training facilities in the package has also stimulated the interests of library professionals towards the goal of Library Automation.

1.1. History of Library Automation:

1.1.1. First Generation
1.1.2. Second Generation
1.1.3. Third Generation
1.1.4. Fourth Generation

1.1.1. First Generation:

- Little integration between modules
- Mainly Circulation & Cataloguing
- Specific to Hardware & OS

1.1.2. Second Generation:

- Various platforms (UNIX and DOS)
- Functions are Command driven or Menu based

1.1.3. Third Generation:

- Fully Integrated Modules (using relational database structures)
- Various Standards
- GUI Based features

1.1.4. Fourth Generation:

- Client-server architecture
- Access to other servers over the Networks
- Allows to access multiple sources

1.2. What is the Meaning of Library Automation? (Melissa Smith, eHow Contributor):

Not many years ago, libraries used card catalogs, typewriters, and manually assigned due dates. Library automation, an up-to-date method to help libraries and library patrons to effectively use library resources, is now streamlined because of computers and software.

1.3. Definitions of Library Automation:

- Automation is a process of using the machineries for easily working and saving the human power and time.
- The main purpose of library automation is to free the librarians and library staff and to allow them to contribute more meaningfully to spread of knowledge and Information.
- In the simple language "When we use machineries for collection, processing, storage and retrieval of information and do an other works of library with the help of machineries that called library automation."

2. Principal Approach to Library Automation:

There are two principle approaches to the development of automated library systems. They are,
2.1. Single Application System
2.2.Integrated System

2.1. Single Application System

2.1.1. Advantages:

- Automation can begin with a small, easily managed system
- It will be possible to implement the automation quickly for the particular function
- It will be less expensive
- It will be easy to change as technology changes

2.1.2. Disadvantages:

- Difficulties may be encountered later in integrating separate functions
- The choice today of a single –function may limit a library's future choice

2.2.Integrated System:

2.2.1. Advantages:

- A large amount of record keeping can be eliminated by automating all functions simultaneously.
- Functions interface with one another.
- Data is not duplicated.
- System provides many access points to data available

2.2.2. Disadvantages:

- Higher initial cost may be incurred than with other system
- Higher conversion cost since many functions are involved
- The library staff needs to adjust too much change in a short period of time

3. Objectives, Features and Characteristics of Library Automation:

3.1. Objectives of Library Automation:

- Development of human resources
- Development of the new library services
- Establishment of a well storage & retrieval system
- Improve Access
- Improve Control & Management
- Improve Services
- Preparation of reports and correspondence
- Proper use of human resources
- Reduce Costs
- Simplicity in library management to meet the objectives
- Speedily disposal of library work
- Suitability for library cooperation & coordination development
- Suitability for resource sharing and networking
- Time and human power saving with qualitative services
- To provide new forms to old services

3.2. Special Features of Library Automation:

- Accuracy in work
- Availability of information
- Avoid duplication in the library work

- Facility to access very large information collections
- It is a time saving system
- It is an electronics based activity which is carried out by human beings
- It is helpful to providing library services
- Networking
- Speedily communication of information
- Standardization in library work
- Support advanced search and retrieval
- Support traditional library system
- Trained staff
- User friendly system

3.3. Characteristics of Library Automation:

- Avoids or reduce human action and thus save time and labour.
- Expands the range and raises the quality of existing services etc.
- Increase productivity, efficiency and speed of library operations.
- Instantaneous answer to multiple queries.
- It faster new products and processes.
- The operation/process is carried out automatically.

4. Need, Factors and Basic Requirements for Library Automation:

4.1. Need for Library Automation:

- Accuracy
- Availability of information in various formats (Print, non-non-print, graphical, audio-visual etc.)
- Different approaches and needs of user
- Duplication in house keeping operation
- Economic feasibility
- Enable their participation in resource-sharing library resource- networks
- Impact of communication technology
- Increasing numbers of users
- Increasing User's expectations and demand
- Information Explosion
- Information in Machine-Readable from
- Limitation of library (time, space & human power)
- Possibility of online information search
- Repetitiveness
- Resource sharing among libraries
- Routine Jobs
- Speed
- Storage Capacity
- To facilitate wider dissemination of their information products and services
- To improve access the resources on other networks and systems, including the Web
- To improve the management of their physical and financial resources
- To improve the quality, speed and effectiveness of services
- To obtain increased operational efficiencies
- To search national and international database
- To well management and retrieval of information

4.2. Factors for Library Automation:

- Cost hike of printed as well as electronic reading materials & resource sharing
- Enhancement in Budget
- Growing information and shrinking space
- Increasement of users

4.3. Basic Requirements for Library Automation:

- Adequate collection
- Financial assistance
- Hardware
- Maintenance & development
- Software
- Trained staff
- User training

5. Benefits, Limitations of Library Automation:

5.1. Benefits of Library Automation:

- Accuracy
- Avoids duplication of procuring documents
- Avoids maintenance of duplicate records, registers, files etc.
- Cataloguing Improvements
- Collections
- Development of human resource
- Easier Access
- Easily searching of information
- Easily working with the help of automation
- Enhanced Professionalism
- Facilitate online search
- Generation of various statistics for decision making
- Helpful in resource sharing
- Helpful in stock verification
- Improved Customer Service
- It motivate to library staff
- Lasting effects
- Provides efficient and valuable services
- Reduces man power requirements
- Speedily communication
- Time saving
- To increase the efficiency of the library staff
- To link the system into other existing systems to the users
- To monitor the rapid growth of information
- To provide SDI/CAS to the readers either on online or through Telephone
- To provide speedy & accurate services to the users
- Up-to-date

5.2. Limitations of Library Automation:

- Budget
- Continuous staff training

- Continuous staff training is required for it
- Costly maintenance
- Financial expenses
- Hardware and Software Obsolescence
- Initial and recurring expenses
- It is long term and time consuming process
- It is totally depended on the electricity
- New Techniques to be learned
- Security problems
- Untrained users

6. Areas and Services of Library Automation:

Library automation is generic term used to denote the various related with the location, acquisition, storage, manipulation, processing, repackaging or reducing dissemination, transmission or communication. The main areas and services of library automation are given below. They are,

6.1. Acquisition
6.2. Cataloguing & Classification
6.3. Circulation control
6.4. Serial Control
6.5. OPAC
6.6. Administration

6.1.Acquisition:

- Checking of overdue orders
- Duplication is checking/library holding checking
- Final report, items/subject wise/chronologically/booksellers report etc
- Inspection of items by the concerned department
- Items verification with order file and invoice
- Preparation of order/cancellation of order list with terms and conditions of the supply
- Prepare budget and maintain accounts and statistics subject wise
- Prepare for payment after accessioning
- Record of items on orders
- Record of received and non-received items and receipt to the vendor
- Selection of vendor

6.2.Cataloguing & Classification:

- Catalogue card production
- Developing centralizes and on-line cataloguing
- Used for the creation, storage, retrieval and management of bibliographic records and/or Indexes.
- Defines the record format used in the database and provides for authority control author, subject headings etc.
- Usually there are two different interfaces for search and retrieval of the electronic catalog:
- For catalogers that allows them to maintain the library database (the main cataloging module),
- For users that allows them to search and display the results – the Online Public Access Catalog (OPAC)

6.3. Circulation Control:

- Handles circulation activities such as: lending, return, renewal, and place on hold
- Interlibrary loan
- Maintenance of circulation, statistics
- Manages library materials - circulation type, location and status; patron database - patron type, profiles, privileges; and other transactions such as computation and payment of overdue fines, lost books, etc.
- May have added value functions like: import, export, and backup and restore functions for the databases; inventory; report generation; and support for MARC, Z39.50, ILL standards.
- May support integration with security systems that complement the self-check-in and checkout features of the circulation module.
- Report/Statistics of circulation
- Use of Barcode

6.4. Serial Control:

- Manages placing, canceling, claiming of orders; returning defective, unwanted and unordered material; and accounting and statistical information.
- May permit serial ordering online
- Mode of payment, prepare of payment
- Preparing the list of current holdings, additions, missing, cancelled serial chronologically/subject wise etc
- Provides a system for recording issues and keeping track of undelivered issues by generating claim reports
- Receipt an updating record
- Receipt to vendors or publishers
- Sending remainders

6.5. OPAC (Online Public Access Catalogue):

- Simple & Advanced Searching
- Boolean search
- Field Based Searching (Author, Subject, Source, etc.,)
- Browsing
  - Field Based
  - Hierarchical
- Personalized OPAC (My OPAC)
  - SDI, CAS, Reservation, DDS, Outstanding Doc's, Subject list, etc.,

6.6. Administration:

- Budget Management
- Eligibility Holiday Maintenance
- Feedback
- Fixing Due dates, Overdue Charges etc.
- Master files Updating
- Module Level Security
- Stock Verification
- User ID & Encrypted Password Protection

7. Communication Networks:

- Library cooperation
- Cooperative acquisition, cataloguing & coordinated services
- Resource sharing

7.1. Access to Database:

- Information services
- Backup services
- Document delivery services

7.2. Access to Internet:

- Information super highway
- Cyberspace
- DIALOG and other databases

7.3. How to go about in Library Automation?

Having determined what activities to be automated, we must carry out a detailed examination of each activity.

- To identify the data elements
- To calculate total storage capacity required
- To identify the various functions to be automated
- To identify those data elements which are common to several functions

7.4. Planning for Library Automation:

- Needs Mapping
- Best possible package
- Staff Involvement
- Budget (Purchase, operation, maintenance, etc,.)
- Hardware Requirement (Client/ Server, Printers, etc)
- Platform (Operating System)
- User awareness
- Maintenance

7.5. Selecting for Library Automation package:

- Minimal training
- Multilingual & Multimedia
- Multi-user and unlimited user access
- Popularity of a package
- Support internationally known standards (MARC,AACR-2, Dublin core, Z.39 etc)
- Training and Support (E-mail, Discussion Forums)
- User friendly
- Well designed screens, logically arranged functions with extensive help messages

7.6. Criteria for Selection of Library Systems:

- Cost
- Features
- Functions

- How it matches the library's requirements.
- Installation date and time duration of installation,
- Product quality
- Staff training
- Support services

7.7. Packages Available for Library Automation:

Many kinds of library packages are available for Library Automation. They are given bellows. Such as,

7.7.1. For Commercial
7.7.2. For Open Source
7.7.3. For Freeware

7.7.1. For Commercial:

- Autolib
- Easylibsoft
- E-Granthalaya
- Gynthalaya
- Libra 2000
- Librarian
- Library Manager
- Libsuite
- Libsys
- Nalanda
- NexLib
- RovanLMS
- SLIM
- SOUL
- VTLS etc.

7.7.2. For Open Source:

- Emilda
- Glibms
- Java Book Catologging System
- Koha
- Mylibrarian(for Schools)
- OpenBiblio
- Open-ILS
- PhpMyLibrary
- CDS Invenio
- Evergreen
- Greenstone
- Kuali OLE
- NewGenLib
- PhpBiblio
- OpenBiblio
- Dspace etc.

7.7.3. For Freeware:

- FireFly

- WebLis etc.

8. Training of the Library Software:

- Self demonstration Programme
- Help menu and software manual
- Separate training model for library professionals

8.1. Guide to Automate Library Systems, Library Software, Hardware & Consulting Companies:

- **Abiogenesis Software**. Software for the creation of electronic dictionaries and reference materials
- **ADLIB Information Systems Ltd.** Library and information management system for libraries, museums and archives
- **Altarama Systems & Services.** Australian owned company specializing in the provision of systems for reference librarians, such as RefTracker request management
- **Ariadne S.r.l. (Italy**). Sibylla
- **Atlantic Rim Information Systems, Inc.** Vendors of AristoCAT
- **Auto-Graphics, Inc**.
- **BLCMP Library Services Ltd.** Supplier of computer systems to public and academic libraries in the British Isles
- **Bailey Solutions** Producer of PenLib, a library management system designed for corporate and special libraries
- **Balboa Software** Library Master, Bibliographic and textual database manager
- **Best-Seller, Inc.**
- **Biblioscape** Bibliographic software to search, organize, generate, and publish bibliographies
- **Book Systems, Inc.** Library software developer of eZcat, eZhost and Concourse library automation systems
- **Brodart Co**.
- **CG Information** .Bibliographic software
- **Cadomel.** PC-based library management systems for small libraries, specializing in school library systems
- **CARL Corporation**
- **CASPR Library Systems, Inc**. Library automation and information management company
- **Church Related Online Software Systems** .Cataloging automation software
- **COMPanion Corporation**. Alexandria for Mac OS and Windows; library automation and information system for schools and districts
- **ConnectLib**
- **Contec Group International Ltd.** C2
- **Cuadra Associates, Inc**. STAR software to manage information stand-alone, networked, on the Internet or on an intranet
- **DRA : Data Research Associates, Inc**.
- **DIAKON Systems** Library software for the small library
- **ebrary.com** Web distribution technology with copyright-protection, using sell-by-the-slice business model for research information
- **Electronic Online Systems (EOS) International** Data Trek
- **Electronic Reading Systems Ltd (ERS)** Specialists in barcode data collection, including Mastalib Automation Software, scanning and barcode printing hardware.
- **ELiAS** including DOBIS/LIBIS and AMICUS
- **Endeavor Information Systems, Inc.**
- **epixtech Inc.** Producer of Dynix and Horizon Sunrise
- **Ex Libris Ltd**. ALEPH (Israel)
- **Fenwood Systems Ltd** (United Kingdom)
- **Follett Software Company**

- **Fretwell-Downing Informatics** .OLIB system, VDX ILL system, and ZPORTAL information portal
- **The Galecia Group** Technology consulting and project management services to libraries
- **Gateway Software Corporation** Library automation software for the K-12 environment
- **Gaylord Brothers Incorporated** including Galaxy and Polaris
- **Geac Computer Corporation's Advance**
- **Great Auk Software Co. BlissLib** Automated Library System, suitable for small corporate, school, or personal collections
- **Hytelnet Information Page** by Peter Scott
- I**LS, International Library Systems, Corp**. SydneyPLUS
- **IT ALISE Ltd.**
- **Information Dimensions, Inc.** A subsidiary of OCLC
- **Inmagic**
- **Innovative Interfaces**
- **Integrity Data Systems, Inc.** Company that designs, builds, and sells web based software for businesses or non-profit organizations, including libraries
- **ISIS EasyCat**
- **ISIS EasyWeb**
- **Jaywil Software Development Inc**. ResourceMate, library software for clergy, professionals, church libraries, corporations and private schools
- **KRC Software** Law library data manager
- **Kelowna Software Ltd.** for Library 4, specializing in school library automation
- **Keystone Systems, Inc**. Keystone Library Automation System (KLAS)
- **LGB & Associates, Inc.** Products include DataLib, VERSO, MLS 3.0, ENTERPRISE 2000
- **Legal Information Management** Text-based information management; Inmagic(R) evaluation software
- **Lex Systems** LexiFile/LexWin
- **Library Associates** including Fastcat
- **The Library Corporation (TLC)** BiblioFile
- **LibraryTools.COM** LC Easy tool and Dewey Easy, training tools on classification
- **MARC Link Retrospective Conversion** Retrospective/database conversion
- **The MARC of Quality (TMQ)** Software and services designed to help create better MARC records more easily
- **MARCIVE, Inc**.
- **MC² Systems** Auto Librarian family of library automation software for the Internet, Windows and MS-DOS
- **Micro Consulting** for BiblioMaker (Switzerland)
- **Micro Librarian Systems** Library automation for education, including Junior Librarian, Eclipse, MagiCat,IdentiKit
- **netLibrary, Inc**. Commercial venture blending electronic books (e-books) with traditional library procedures such as circulation
- **Neuton Data Systems** School library automation products and services
- **New Generation Technologies Inc** for Librarysoft Library Automation System
- **Nexus srl**
- **Niles & Associates, Inc.** Bibliographic software, including EndNote Plus and EndLink for Windows and Mac
- **Obvia Corporation** Remote Database Access Service
- **On Point, Inc.** TLC Total Library Computerization
- **Open Text Corporation** Web-based software solutions for library automation (Techlib) and collaborative knowledge management (Livelink)
- **Openly Informatics, Inc**. Software, systems and services for link server solutions
- **Ovid Technologies, Inc.** Bibliographic and live full text databases for academic, biomedical and scientific research

- **Pica** Library automation and online services in the Netherlands
- **Practical Software Solutions** School-oriented Dewey Decimal Library Program
- **R2 Consulting Services** Strategic consulting on ebooks, the Web, electronic tools and improving workflow efficiencies to academic libraries and their vendors
- **RealRead, Inc**. Technology allowing online book buyers to preview extended information
- **Research Information Systems** Reference Manager and Reference Update
- **SFX** Software from Ex Libris for linking between scholarly information resources
- **Sagebrush Technologies** (formerly Nichols Advanced Technologies Inc.) MOLLI and Athena
- **Robert A. Schless & Co Inc** NOTEbookS, a Lotus Notes based integrated special library system
- **Sea Change Corporation** BookWhere, Windows software to search multiple Z39.50 host sites and databases for bibliographic references in a single operation
- **SerialSSolutions** Providing systems for finding full-text electronic journals from database aggregators
- **SIMA, Inc.** For law libraries
- **SIRS Mandarin, Inc.**
- **SIRSI** Unicorn
- **SLS (Information Systems) Ltd.** producers of LIBERTAS
- Smiths Falls Systems Inc. Producing software solutions for bookbinders and library binding departments
- **Softlink America, Inc.** Library software developers of integrated library systems for small to medium libraries
- **Softlink Europe Limited** Alice Library Management software for all libraries, including primary school, secondary school, college/university or special
- **Soutron Ltd.**
- **Stowe Computing Australia**
- **Surpass Software** Library automation products for school, corporate, small public, and special libraries
- **Swets & Zeitlinger B.V.**
- **Syndetic Solutions** Provider of specialized bibliographic data to producers of electronic databases in the book trade, including augmentation of MARC records
- **TKM Software Limited** Library automation software company, for schools, public libraries, special libraries and health libraries
- **VTLS**
- **vImpact, Inc.** The Library Channel, Internet control software for libraries
- **WLN**

8.2. Challenges before Librarians of Libraries:

Library Managers are facing various Challenges. Some of them listed below;

- Changed users information behavior and reading habits
- Concept of 24 hours and 7 days library and information services
- Demand foe web based products and services
- Demand for effective monitoring and feedback system
- Demand for quality based library and information products and services
- Demand for the creation of culture for creativity
- Diversity of programs and emerging thrust areas
- Emergence of library networking and networks
- Expectation for resource generation
- Explosive growth of electronic information and products
- Impact of ICT on library practices
- Increased and diversified users information thrust and need
- Increased cost of information materials

- Marketing of library and information products and services
- Need for effective and efficient users interface
- Need for interaction with external environment
- Need for the development of information infrastructure
- Need to create specialized databases
- Need to develop sustainable collection building strategy
- New electronic information environment
- New roles and responsibilities
- New tools and techniques of information handling
- Philosophy of information at door
- Responsiveness and dynamism in special library systems and services
- Timely delivery of information materials to end-users

8.3. Suggestions for Library Automation:

- Economical help should be provided by central, state, local govt. and library authority according to library and information policy.
- Libraries should be conducted training program time to time for the development of library staff.
- Librarian should be selected best hardware and software for automation
- All the data or information should be secure with the help of different security tool such as use of Anti-virus, firewall and Anti- taking a backup of data time to time.
- Inverter should be used for power.

9. Conclusion:

Automation is a process to supplement human activities with mechanical, electrical or electronic devices. In libraries, computers help us by storing all the details about the books, periodicals and also retrieving the requires information as and when needed. The speed and accuracy of the computers not only save the time of the readers but also increase the efficiency of the library staff in information retrieval and other library services. Libraries, librarians, and college administrations must initiate automation in order to provide effective and efficient services to users. Library professionals must upgrade their skills in order to meet the growing expectations of users from libraries. Thus conclusive note it can be stated that in the fast changing world of information technology, the use of computer has become an essential feature of the library.

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