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Sustainable Library

Librarian Special Seminar Volume: 26, Issue 1 & 2, January 2020



Department of Library and Information Science
Jadavpur University, Kolkata 700 032
(NSSL -2020)

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Editor - in - Chief
Subarna Kumar Das



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e-mail: hod@libsc.jdvu.ac.in

website: http://www.jaduniv.edu.in/htdocs/view_department.php?deptid=71

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Editorial



In recent years, librarians have become more interested in making their buildings more environmentally friendly. But buildings are only the tip of the iceberg. Libraries are trusted information sources for their communities. This puts them in an excellent position to become community leaders and models of environmental responsibility. In today's world, libraries cannot afford to be passive or neutral. We find ourselves contending with disruption on all fronts—political, social, economic, technological, and environmental. Fully participating in community life through the pursuit of our professional values has never been more critical. At the American Library Association's (ALA) 2015 Annual Conference and Exhibition, ALA Council adopted the Resolution on the Importance of Sustainable Libraries. This resolution was a watershed moment in the history of American libraries, as it is the professional recognition of the important and unique role libraries can play in wider community conversations about resiliency, climate change, and a sustainable future for us all. Members of our community—whether that be a town, school, campus, or special population—are usually seen as factions and demographics. They're labeled as Democrat or Republican, have or have-not, digital native or older generation. But there is one thing we all have in common, and it's very big: We all live on planet Earth. We all rely on one another to have healthy air, clean water, and enough natural resources to help guarantee food security, economic vitality, and social equity. Climate disruption is real. Depletion of natural resources is happening. Unequal access to healthy ecosystems and built environments is the norm. In 2014, the Intergovernmental Panel on Climate Change of the United Nations and World Meteorological Association identified that we have reached a point in our history when it is no longer about saving the Earth, but surviving it. Our only hope is to work together to survive what is happening and what will come next, primarily because we don't know what will come next. We can try to guess, or we can focus on developing resilient communities. Places where people know and respect one another. Places where solutions to common problems can be found, with the library serving as an exemplar, catalyst, and convener.

Professor Subarna Kumar Das
Editor-in-Chief

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Changing mode of library functions for it's sustainability

Dr Sudip Ranjan Hatua

Assistant Professor

Department of Library & Information Science

Rabindra Bharati University

Email: s.r.hatua@rbu.ac.in

***Abstract :** The Agenda for Sustainable Development Goal-2030 was adopted by the United Nations in 2015, which gives a blueprint for peace and prosperity for people and the planet, now and into the future. They set strategies to improve health and education, reduce inequality, and economic growth in terms of the utility of environment and natural resources to preserve our oceans and forests for the future. They set 17 goals for that. IFLA and the UN believe that the library can play a major role to fulfil the target of SDG-2030. However, the question is with the changing ICT environment whether the libraries can sustain in the near future? This paper has provided a few specific changing modes of functions which may help libraries to become sustainable.*

***Keyword :** Sustainable Development Goal-2030, Query Catalogue, Sustainable library, Interpersonal relationship, Emotional Web*

1. Introduction

The ideas of 'Sustainable Future' consist of two terms "future' and 'sustainable'. The 'future' means will appear after present and according to Cambridge Dictionary the term 'sustainable' means 'able to continue over the time'. We have developed in every aspect of our life by using science and technology. Then, why people are talking about 'sustainable future'? Probably we are suspecting not able to keep maintaining the development we achieved at the same pace and probably we are threatening our own ability to enjoy the future. Global warming, scarcity of natural resources, pollution, natural calamities regularly are the basic causes for this suspicion of sustainability.

The Brundtland Commission [accessed on 15th January 2020 <https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf>] of UN defined this in the context of socio-economic development in terms of utility of environment and natural resources which emphasis to meet the requirement of the present without compromising the ability of the future generation to meet their own need. 'Sustainability' nowadays is one of the leading global issue popularly known as Agenda for Sustainable Development Goals (SDGs)-2030. They have set major 17 goals for sustainability. UN, as well as IFLA, considered that to achieve all the goals the library might have taken the major role. However, among all 17 goals, 'Goal 4' is directly related to the library. This goal states that 'ensure inclusive and equitable quality education and promote lifelong learning opportunities for all'. [United Nations Resolution adopted by the General Assembly on 25 September 2015 available at <https://www.un.org/ga/search/>

view_doc.asp?symbol=A/RES/70/1&Lang=E]. Yes, this is very much true that to fulfil 'sustainable development' we should keep continuing the life long learning. No institution except library can provide the opportunity for life long learning and quality education.

2 How the library can play the role of SDG?

It is well established and known that all the libraries around the globe offer lots of products and services to make illiterate to neo-literate, from literate to educated and continues for life long learning. It becomes the backbone to every community as well as the nation. They collect, preserve, disseminate and allow to access, culture and practice of universe of knowledge and promote innovation, creativity and research for the benefits of current and future generations. Thus helps to achieve all SDG.

3 The threat to the sustainability of libraries

The question is whether library itself will be sustained to play an important role to achieve SDG-2030 or in near future? Many people now-a-day think that libraries might have an important asset or status symbol but practically technology has made library services obsolete and the budget allocations to the libraries make their argument undeniable.

Keeping the basic skeleton unchanged libraries have updated itself time to time and probably the first sector which has adopted and exploits technologies maximum. Starting from OPAC to Web 5.0- Open, Linked and Intelligent Web known as Emotional Web, from digital resource management to cloud computing, wherever or whatever we jump, we adopt, we provide services but at the end of the day we found libraries are one of the most neglected sectors around the world. Libraries have its potential that has been developed and sustained for many years based on printing and other collections and services. Libraries have adopted technology and created a digital environment and communication to its users. Libraries have remarkably changed its'

mode of services and providing lots of value-added services but still, it is under threat of sustainability.

3.1 Why?

In spite of the huge potentiality to take part in the development of society, it has given very less importance in all the sectors from the public to academic, from academic to special libraries. Why is such a thing happening? Why the learned society, policymakers, Govt. officials, institutional heads don't realize the importance of the library? We may identify a few factors for the threat of sustainability of libraries-

- Hardly people know what the librarian actually means and what it does; Most of the people never see the background housekeeping operations of a library. They only see the people seating in the front and just taking and giving books. Few users are sitting here and there (reading room) and spending time idle. They thought why this waste of money by investing huge amount for purchasing books while most of them are not used.
- Introduction of the Internet into our lives has brought the biggest threat to libraries; facts are true or false people never think but most of the people believe that every information is available on Internet, specifically in Google. The new generation of users also very much accustomed to googling and find factual information to prepare there project, assignment and never bother about whether that information is relevant and trustworthy or not.
- People hardly believe that a librarian can provide the better document or can compile documents than any others person or media; Not only common people but also many researchers and the serious reader also have very little ideas about specialized service and information products like abstracting, indexing databases. Few of them might know about enterprise databases. The authority feels that there is no role of librarian except negotiation

with the publishers (of ProQuest, wos, oup, Willey, Thomson etc). If we have money then all required journal or e-book and other databases can be subscribed with all searching, reading and full-text download facilities. Then why the library?

- People like to have them around and are angry if they close. But as for using them, there is so little time these days. This is all extracts about public libraries. There is no advocacy in this matter from common people. Only a few old people and library professionals are shouting silently for public libraries. Many public libraries either closed or partially functional with very less number of users and society have no time to look after it. Why the Government will give incentives to those public libraries?
- The digital revolution has caused many in society including policymakers, people to ask whether nowadays libraries be relevant to their communities. No public library can build-up environment for community information services. Youth job seekers now prepare and find question papers and practice for competitive examination online. No communities have ideas that they can especially benefit from the library or hardly any librarian have time or motivation to build the local community to provide specialized services. There is a tremendous paradox exists between the library and society.

3.2 Can things be changed?

Change is life. Nothing is permanent except 'change'. Once upon a time when we thought that telephone, televisions were the status symbol. Books, libraries were the cultural and educational symbol. Parents, grandparents have nothing around to explore except books. And where should they get those treasure of books, free of cost? That was the library. They took it into their socio-cultural-academic life. Their thought, their habit and their acceptability, availability of knowledge was different from now. So it is expected that what we see today will change tomorrow. Because

that is the 'change' and that will sustain. Now we have a smartphone, we have digital information and have a network. We can practically hold, access, retrieve all the library and their collection, information and can get, read, download, print any document (free or by giving nominal price) in any form available in the world in our finger tip. Why should we go to the library?

Being a library professional we should think it seriously. The way we see in the library fifty years back should not be the same today. So to survive and make library sustainable we should change the mode of library operations and services.

- US, UK and many other countries switched the public libraries as important community hubs that serve as centres of learning, professional development, healthcare, and not just storage spaces for books. In all libraries, every resource including books, internet access, and educational and professional training programs for individuals and families should be free of charge.
- Libraries are preparing and providing catalogue services for a long time. But to sustain libraries should think about query catalogue services- the new way of thinking. This 'Query Catalogue' may include the answers of questions about computer and internet training, job applications and resume writing, filling out government forms, including tax and health insurance paperwork, stock exchange, share market etc.
- To make libraries a sustainable future library should play a key role in financially strengthening the local community. The conventional ideas may cynical to many people like us but this could be one alternative to a sustainable library system. The library should provide a workspace for telecommuters, supply free internet access for people looking for employment opportunities, and offer job and interview training for those in need. Thus they may earn money as well as attraction to users and publicity.

- The library should conduct regular community programs. Together with local governments, healthcare providers, and medical professionals, librarian directly assists in fitness classes, and basic internet access, libraries provide important equal access opportunities to those seeking health information and services.
- Libraries truly are remarkable places, and in today's world by providing or act as a community centre, town hall, or public park etc. Thus libraries connect their communities in a way that benefits all local community and become a truly public institution.
- Libraries, especially public libraries can also make a fundamental contribution to social and economic development by conducting various cultural activity and programmes by ensuring that cultural interests are represented in the library's materials; In academic library students competency development programme, programme on MOOCs, Swayam can be arranged regularly. Not only concentrating only in-house programme a librarian by using his interpersonal relations can build public relations with media and beyond campus by using various techniques like advertising, lobbying, marketing and publicity.

3.3 Effective Communication

Effective communication may play an important role to create an open and reliable environment for organizational success. Libraries nowadays become very smart with the digital environment and timely contact with people. But one important thing is missing in this IT-enabled smart library system i.e. 'interpersonal relationship'. The attitude of librarian and it's a higher authority, the intention of principal and expectation of librarian, the perception towards the users etc. affects to build an interpersonal relationship. Interpersonal relationship will be more effective and work can be done more comfortably if we get it done by reaching physically. Most of today's librarian feels

that mobile phone, email, social media are the best communication channel. Yes, it may be very fast and widely distributed and timely reached but most of the cases some personal touch and affection are missing here. As a result, a shortcoming of bonding between interpersonal communications will arise. They should not always sit in their library and wait for the user. They should visit the classroom, faculty lounge, department, students union, officers and staff office physically and communicate and aware uninterruptedly about what a library can do better for them. Good behaviour, a good posture and relation can get many things done easily. So, a library's future and success depend not on the application of technology, self-knowledge of ICT and social media but the skill to develop an interpersonal relationship.

4. Conclusion

To make library attracting and for its sustainability and to fulfil SDG-2030 library should walk in little different way keeping intact the hardcore library services and activities. Simultaneously people especially the young generation should believe the value and importance of the library. In all academic programme starting from their kinder garden school to the highest level of education, there should be a mandatory orientation programme for the library. The voluntary services in the library is an essential task of every student in many American and European countries. The modern librarian should not only able to IT handling skills but also should create interpersonal relationship among local administrators, legislators, Government officials, renowned persons, youth, sports personalities and other areas etc. Of course, this is not only the responsibility of the librarian but also all library supporters. They should not only blame the government but also raise voice for library, communicate neighbour, children, friends, local influential people, community leaders, elected and government officials, teachers, businessman. Thus a human network will be created and that will help the library to sustain in future.

Use of e-information resources through the semantic web technologies, where computer will understand the meaning of the text, can indirectly help to develop sustainable library

Dr. Sibsankar Jana

Assistant Professor, Department of Library & Information Science
University of Kalyani

0 Backdrop

Green library is a library designed to minimize negative impact on the natural environment. We need to take some measures to attain the sustainable library or green library. Some of the characteristics of green library are:

- Natural products may be used for preservation of books.
- Solar panel may be placed on library building for creating solar energy.
- Library building may be in modular structure so that solar energy and also roof top vegetation can be made by team work of the library staffs.
- Indoor air quality may be increased by growing indoor plants.
- Laptops which use less electricity than desktop versions
- Providing scanning service instead of xerox which reduce use of paper.
- Avoid readers ticket as it is made of plastic.
- Membership through online and supporting documents in soft copy only.
- Card catalogue may be removed and OPAC may be provided.
- E-receipts may be given instead of paper receipts.
- Use of e-resources
- Electronic equipments of latest star rating for reducing the consumption
- Lighting of the library through the natural light during day time
- LED bulbs and tubes may be used for lightning.
- Provide online services by making use of web 2.0 and web 3.0 technologies

We all know that it would take a little more than half a tree to make a carton (10 reams) of 100 percent, non-recycled 20-lb. copier paper. One tree makes 16.67 reams of copy paper, or 8,333.3 sheets. One ream (500 sheets) uses 6 percent of a tree. According to the National Forest Service website, as much as 85 percent of the trees are used in the making of paper and paper products are coniferous. Hardwoods such as maples and oaks comprise the rest of the trees employed in this process. ... White pine is still an important paper-producing tree.

So, maximum use of e-information will minimize the use of printed documents and which again will indirectly enhance the establishment of SUSTAINABLE or GREEN LIBRARY. So, we need to create, organize and disseminate optimum e-information. In this regard, it is important to organize e-information so that effective retrieval is possible. It is possible when machine can understand the meaning of the text in natural language. Therefore we need to develop semantic web where computer can understand the meaning of query and document and can retrieve the right and exact answer to the query.

1 Introduction

The Semantic Web involves publishing in languages specifically designed for data: Resource Description Framework (RDF), Web Ontology Language (OWL), and Extensible Markup Language (XML). HTML describes documents and the links between them. RDF, OWL, and XML, by contrast, can describe arbitrary things such as people, meetings, or airplane parts.

Tim Berners-Lee has described the semantic web as a component of «Web 3.0». People keep asking what Web 3.0 is. I think maybe when you've got an overlay of scalable vector graphics – everything rippling and folding and looking misty – on Web 2.0 and access to a semantic Web integrated across a huge space of data, you'll have access to an unbelievable data resource ...

—Tim Berners-Lee, 2006 “Semantic Web” is sometimes used as a synonym for “Web 3.0”, though each term's definition varies.

2. Standards

Standardization for Semantic Web in the context of Web 3.0 is under the care of W3C. The term “Semantic Web” is often used more specifically to refer to the formats and technologies that enable it. The collection, structuring and recovery of linked data are enabled by technologies that provide a formal description of concepts, terms, and relationships within a given knowledge domain. These technologies are specified as W3C standards and include:

- Resource Description Framework (RDF), a general method for describing information
- RDF Schema (RDFS)
- Simple Knowledge Organization System (SKOS)
- SPARQL, an RDF query language
- N-Triples, a format for storing and transmitting data
- Turtle (Terse RDF Triple Language)
- Web Ontology Language (OWL), a family of knowledge representation languages
- Rule Interchange Format (RIF), a framework of web rule language dialects supporting rule interchange on the Web

3. Technologies of Semantic web

3.1 Explicit Metadata

Currently, web content is formatted for human readers rather than computer programs. So, we need to insert metadata within the text so that machine can understand the meaning.

- a) **HTML:** The HTML, being a designing/formatting language is used to design the web content for easy understanding of the readers. But, machines will have their problems. The <meta> tag provides metadata about the HTML document. Metadata will not be displayed on the page, but will be machine parsable. Meta elements are typically used to specify page description, keywords, author of the document, last modified, and other metadata. The metadata can be used by browsers (how to display content or reload page), search engines (keywords), or other web services.

```
<head><meta charset="UTF-8">
<meta name="description" content="Free Web tutorials">
<meta name="keywords" content="HTML,CSS,XML,JavaScript">
<meta name="author" content="Hege Refsnes">
</head>
```

- b) **XML:** The XML is a universal meta-language for defining markup. The search engine will collect metadata from <head> section in HTML. So we need to insert metadata into the content so that program can understand the semantics of the web content. XML can do this job. With the help of XML the each and every elements of web content may be structured by using extensible tags of our own.
- c) **RDF:** XML provides a uniform framework and set of tools like parsers, for interchange of data and metadata between applications. It does not provide any meaning of data in semantic web. Therefore we need another one to compliment XML. RDF, Resource Description Framework is essentially a data model having Object-Attribute-Value Triple.

3.2 Ontology

The term Ontology originates from philosophy. It describes formally a domain of discourse. It is basically a finite list of terms and the relations among them. Apart from sub-class relationships, it may include information such as (University website):

- Properties (A teaches B)
- Value restrictions (only faculty members may teach courses)
- Disjointness statements (faculty and general staff are disjoint)
- Specifications of logical relationships between objects (every departments must include at least ten faculty members).

It provides shared understanding of a domain. It can help to understand the similar concepts like ZIP code, Area code, PIN code etc.

3.3 Logic

It is the study of the principles of reasoning. In general logic offers:

- Formal languages for expressing knowledge

- Well-understood formal semantics
- Making implicit knowledge explicit
 - Prof (X) → faculty (X)
 - Faculty (X) → staff (X)
 - Prof (Roy)
 - So Ontology can say:
 - Faculty (Roy)
 - Staff (Roy)
 - Prof (X) → staff (X)

3.4 Agent

Agents are pieces of software that work autonomously and proactively. It may be personal in nature. Their role will be to collect and organize information and present choices for the users to select. It will make use of all the technologies mentioned above:

- Metadata will be used to identify and extract information from web sources.
- Ontologies will be used to assist in web searches, to interpret retrieved information, and to communicate with other agents.
- Logic will be used for processing retrieved information and for drawing conclusions.

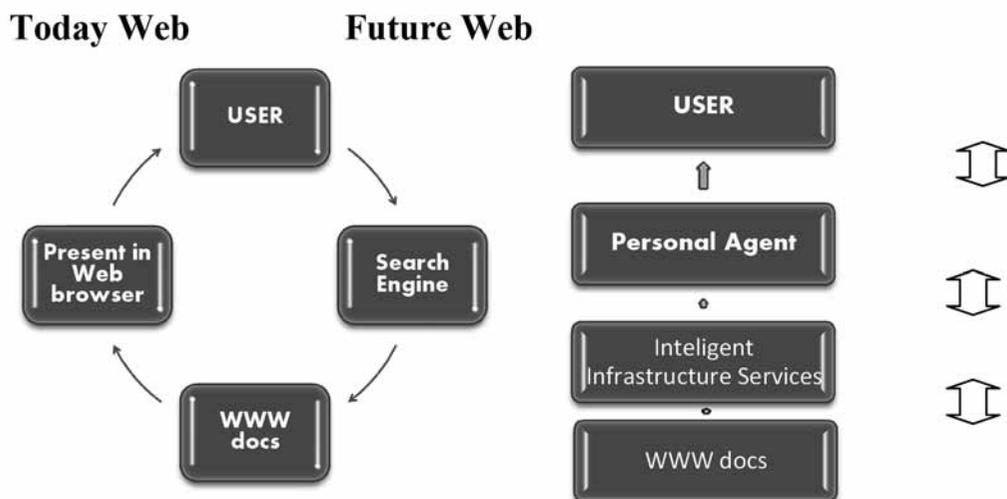


Figure-1: Intelligent Personal Agents

4. Tools and components of semantic web

The Layered approach of Semantic Web i.e. Semantic Web Stack (Fig-1) illustrates the architecture of the Semantic Web. In building one layer of the semantic web on the top of another, two principles should be followed:

- a) **Downward compatibility:** Agent fully aware of a layer should also be able to interpret and use information written at lower levels. For example, agents aware of the semantics of OWL can take full advantage of information written in RDF and RDF Schema.
- b) **Upward partial understanding:** The design should be such that agents fully aware of a layer should be able to take at least partial advantage of information at higher levels. For example, an agent aware only of the RDF and RDF Schema semantics might interpret knowledge written in OWL partly by disregarding those elements that go beyond RDF and RDF Schema. Of course, there is no requirement for all tools to provide this functionality; the point is that this option should be enabled.

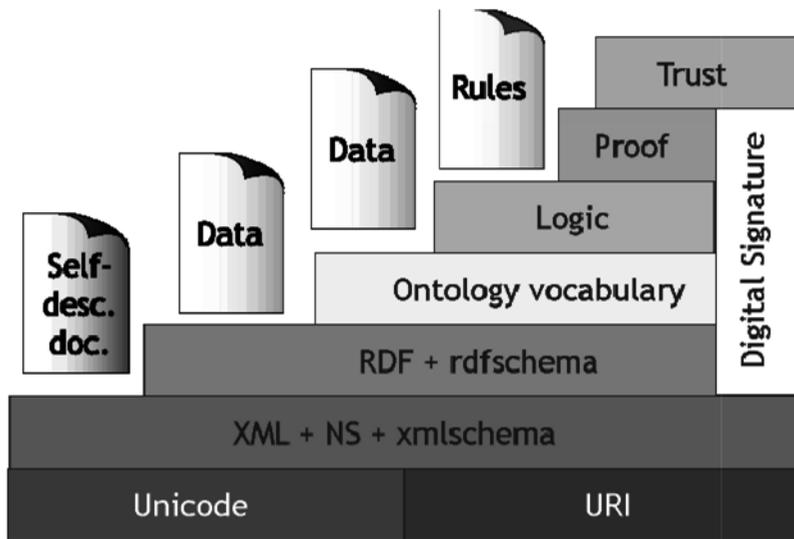


Figure-2: Classical layered approach to Semantic Web

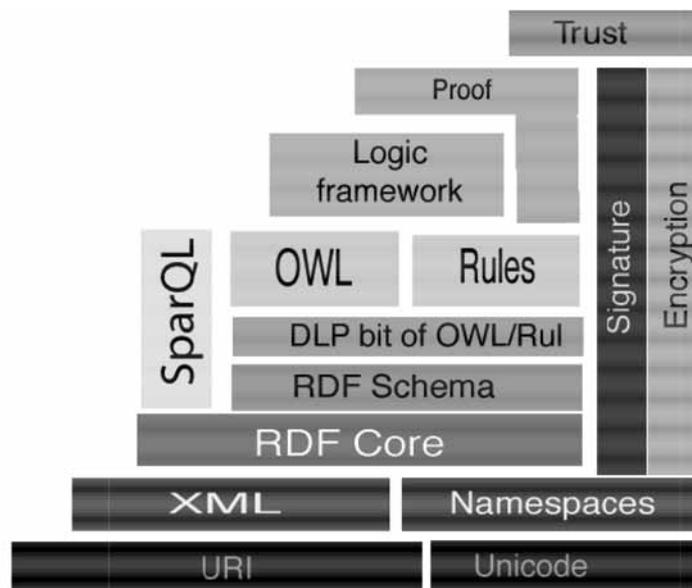


Figure-3: Alternate layered approach to Semantic Web

The functions and relationships of the components and tools can be summarized as follows:

A. Hypertext Web Tools

The bottom layers contain technologies that are well known from hypertext web and that without change provide basis for the semantic web.

a) Unicode and URI

- 1) **URI:** Internationalized Resource Identifier (IRI), generalization of URI, provides means for uniquely identifying semantic web resources. Semantic Web needs unique identification to allow provable manipulation with resources in the top layers.
- 2) **Unicode:** Unicode serves to represent and manipulate text in many languages. Semantic Web should also help to bridge documents in different human languages, so it should be able to represent them.

b) XML + XML NS + XML DTD/Schema

- 1) **XML:** XML is a markup language that enables creation of documents composed of structured data. Semantic web gives meaning (semantics) to structured data. XML provides an elemental syntax for content structure within documents, yet associates no semantics with the meaning of the content contained within. XML is not at present a necessary component of Semantic Web technologies in most cases, as alternative syntaxes exist, such as Turtle. Turtle is a de facto standard, but has not been through a formal standardization process. An XML document consists of:

- i) **Prolog:** It consists of an XML declaration and optional reference to external structuring documents.

a. **XML Declaration:** `<?xml version="1.0" encoding="UTF-16"?>`.

`?xml` = It is an XML document

`Version="1.0"` = Version of XML document

`Encoding="UTF-16"` = Character encoding system. It may be UTF-8 and ISO 8859-1

b. **Reference to External Structuring Documents:** `<!DOCTYPE book SYSTEM "book.dtd">`.

Here structuring information is found in local file called book.dtd. It may be a URL. SYSTEM is used for local file or URL. However PUBLIC is used for both local and URL.

- ii) **Elements:** XML elements represent the “things” the XML document talks about, such as books, authors, and publishers. It consists of an opening tag, its content and a closing tag.

Opening tag	Content	Closing tag
-------------	---------	-------------

Example: `<assistantProfessor>Sibsankar Jana</assistantProfessor>`

XML Naming Rules for Tag:

XML elements must follow these naming rules:

- Element names are case-sensitive
- Element names must start with a letter or underscore
- Element names cannot start with the letters xml (or XML, or Xml, etc)
- Element names can contain letters, digits, hyphens, underscores, and periods
- Element names cannot contain spaces
- Any name can be used, no words are reserved (except xml).

Naming Styles

There are no naming styles defined for XML elements. But here are some commonly used:

Style	Example	Description
Lower case	<firstname>	All letters lower case
Upper case	<FIRSTNAME>	All letters upper case
Underscore	<first_name>	Underscore separates words
Pascal case	<FirstName>	Uppercase first letter in each word
Camel case	<firstName>	Uppercase first letter in each word except the first

```

<assistantProfessor>
  <name>Sibsankar Jana</name>
  <mobNo>09433886928</mobNo>
</assistantProfessor>

```

If there is no content, the element is called empty. It looks like:

```

<assistantProfessor></assistantProfessor>
<assistantProfessor/>

```

- iii) **Attributes:** An attribute is a name-value pair inside the opening tag of an element. For example: `<assistantProfessor name="Sibsankar Jana" mobNo="09433886928"/>`
- iv) **Comments:** A comment is a piece of text that is to be ignored by the parser. It looks like: `<!--This is the Comment-->`
- v) **Processing Instruction (PIs):** It provides a mechanism for passing information to an application about how to handle elements. The general form is:


```

<?target instruction?>

```

 For example:


```

<?stylesheet type="text/css" href="mystyle.css"?>

```
- vi) **Well-formed XML document:** XML follows some syntactic rules
 - The only one outermost element is called root element
 - Each element contains an opening and a closing tag.
 - All tags will be nested, and not overlapped
 - XML documents may be represented by tree structure

```

<?xml version="1.0" encoding="UTF-16"?>
<!DOCTYPE library SYSTEM "library.dtd">
<library location="Kalyani University">
  <author name="Krishan Kumar">
    <book title="Library Classification"/>
    <book title="Cataloguing"/>
    <book title="Reference Service"/>
  </author>
  <author name="S R Ranganathan">
    <book title="Cataloguing"/>
    <book title="Prolegomena to Library Classification"/>
  </author>
  <author name="A K Ohdedar">
    <book title="Research Methodology"/>
  </author>
</library>

```

The Tree representation of the above XML document:

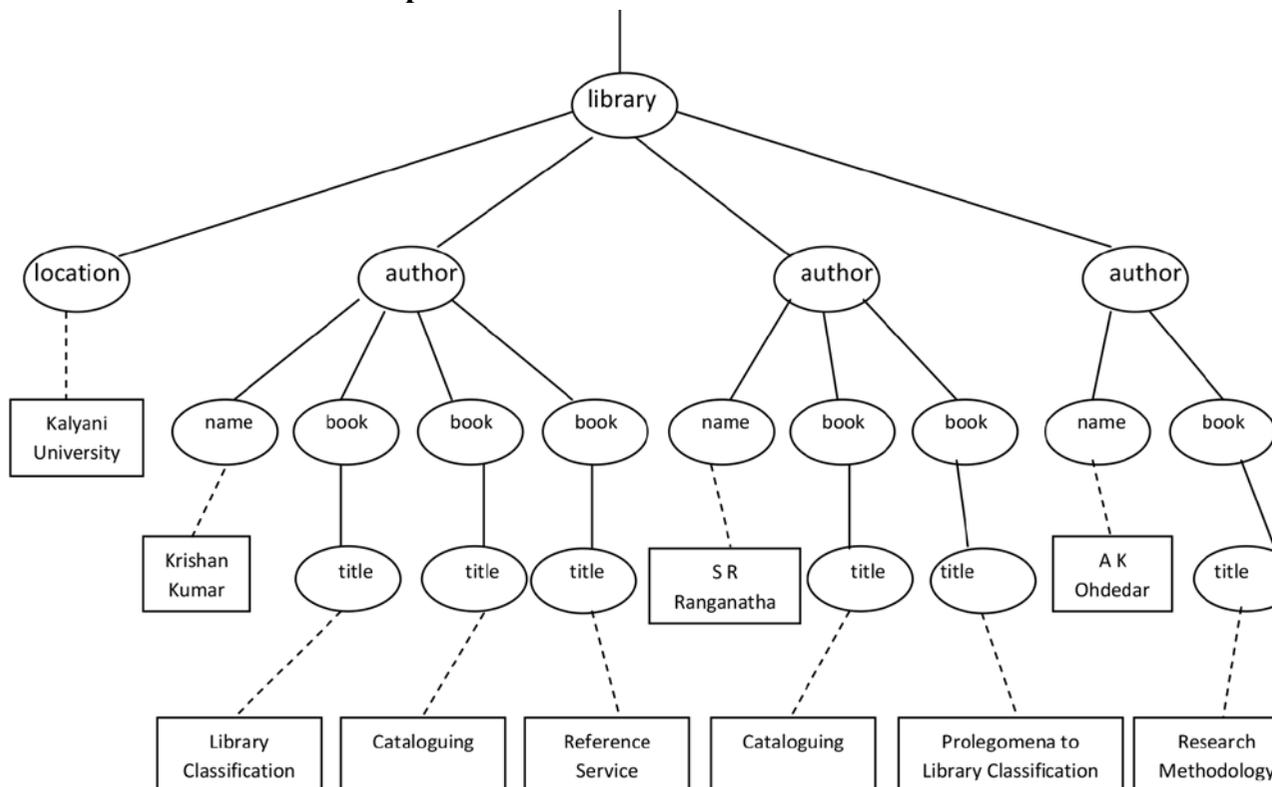


Figure-4: Graphical representation of XML document

- 2) **XML DTD and XML Schema:** The syntactic rules say nothing about the structure of the XML document. Suppose two applications are trying to communicate and they used same vocabularies. Therefore we need to define the structure having elements, attributes and values etc. There are two ways of defining the structure:
- a) **XML DTD:** The components of a DTD can be defined in a separate file (external DTD) or within the XML document itself (Internal DTD).
- i) **ELEMENT**

Consider the element:

```
<assistantProfessor>
  <name>Sibsankar Jana</name>
  <mobNo>09433886928</mobNo>
</assistantProfessor>
```

A DTD for this element type looks like:

```
<!ELEMENT assistantProfessor (name, mobNo)>
  <! ELEMENT name (#PCDATA)>
  <! ELEMENT mobNo (#PCDATA)>
</assistantProfessor>
```

Meaning of the DTD is as follows:

- The element types *assistantProfessor*, *name* and *mobNo* may be used in the document.
- A *assistantProfessor* element contains a *name* element and a *mobNo* element in that order.
- A *name* element and a *mobNo* element may have any content. In DTDs, #PCDATA is the only atomic type for element.

If we want to express that a *assistantProfessor* element contains either a *name* element or a *mobNo* element then DTD will be as follows:

```
<! ELEMENT assistantProfessor (name | mobNo)>
```

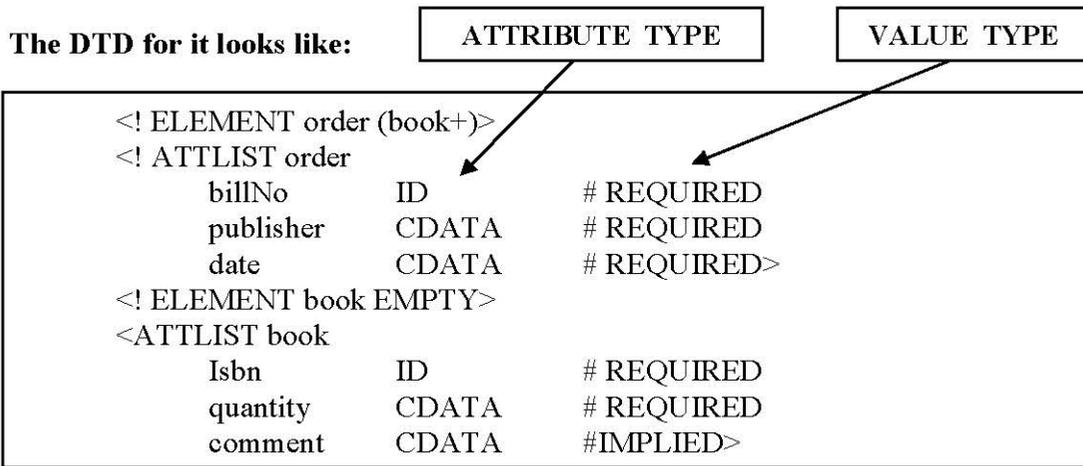
But if we want to express that a *assistantProfessor* element contains either a *name* element or a *mobNo* element in any order then DTD will be as follows:

```
<! ELEMENT assistantProfessor ((name, mobNo) | (mobNo, name))>
```

ii) **ATTRIBUTES**

Consider the element

```
<order billNo="123" publisher="Willey" date="November 23, 2017">
  <book isbn="1234567891234" quantity="3"/>
  <book isbn="9876567891234" quantity="8"/>
</order>
```



Here, a new aspect is that the *book* element type is defined as EMPTY. Another new aspect is the appearance of + after *book* in the definition of the *order* element type. It is one of the CARDINALITY OPERATOR:

- ? Appears zero times or once
- * Appears zero or more times
- + Appears one or more times

No CARDINALITY OPERATOR means exactly once.

ATTRIBUTE TYPES

CDATA – A string (sequence of characters)

ID – A name that is unique across the entire XML document

IDREF – A reference to another element with an ID attribute carrying the same value as the IDREF attribute

IDREFS – A series of IDREFs

VALUE TYPES

REQUIRED – The attribute must appear in every occurrence of the element type in the XML document. In the above example, *isbn* and *quantity* must always appear within a *book* element.

IMPLIED – The appearance of the attribute is optional. In this example COMMENTS are optional.

FIXED “value” – Every element must have this attribute, which has always the value given after # FIXED in the DTD.

“value” – This specifies the default value for the attribute.

- b) **XML Schema:** XML Schema is a language for providing and restricting the structure and content of elements contained within XML documents. Its syntax is based on XML itself.
- 3) **XML Namespace:** XML document may use more than one DTD or Schema. But since each structuring document was developed independently, name clashes appear inevitable. If DTD A and DTD B define an element type *e* in different ways, a parser that tries to validate an XML document in which an *e* element appear must be told which DTD to use for validation purposes. The technical solution is simple: disambiguation is achieved by using different prefix for each DTD or schema. The prefix is separated from the local name by a colon:

Prefix:name

XML Namespaces provide a method to avoid element name conflicts.

Name Conflicts

In XML, element names are defined by the developer. This often results in a conflict when trying to mix XML documents from different XML applications.

This XML carries HTML table information:

```
<table>
  <tr>
    <td>Apples</td>
    <td>Bananas</td>
  </tr>
</table>
```

This XML carries information about a table (a piece of furniture):

```
<table>
  <name>African Coffee
  Table</name>
  <width>80</width>
  <length>120</length>
</table>
```

If these XML fragments were added together, there would be a name conflict. Both contain a `<table>` element, but the elements have different content and meaning. A user or an XML application will not know how to handle these differences.

Solving the Name Conflict Using a Prefix

Name conflicts in XML can easily be avoided using a name prefix.

This XML carries information about an HTML table, and a piece of furniture:

```
<h:table>
  <h:tr>
    <h:td>Apples</h:td>
    <h:td>Bananas</h:td>
  </h:tr>
</h:table>

<f:table>
  <f:name>African Coffee Table</f:name>
  <f:width>80</f:width>
  <f:length>120</f:length>
</f:table>
```

In the example above, there will be no conflict because the two <table> elements have different names.

XML Namespaces - The xmlns Attribute

When using prefixes in XML, a so-called **namespace** for the prefix must be defined.

The namespace is defined by the **xmlns attribute** in the start tag of an element.

The namespace declaration has the following syntax. `xmlns:prefix="URI"`.

```
<root>

  <h:table xmlns:h="http://www.w3.org/TR/html4/">
    <h:tr>
      <h:td>Apples</h:td>
      <h:td>Bananas</h:td>
    </h:tr>
  </h:table>

  <f:table xmlns:f="http://www.w3schools.com/furniture">
    <f:name>African Coffee Table</f:name>
    <f:width>80</f:width>
    <f:length>120</f:length>
  </f:table>

</root>
```

In the example above, the xmlns attribute in the <table> tag give the h: and f: prefixes a qualified namespace. When a namespace is defined for an element, all child elements with the same prefix are associated with the same namespace.

Namespaces can be declared in the elements where they are used or in the XML root element:

```
<root xmlns:h="http://www.w3.org/TR/html4/"
xmlns:f="http://www.w3schools.com/furniture">
<h:table>
  <h:tr>
    <h:td>Apples</h:td>
    <h:td>Bananas</h:td>
  </h:tr>
</h:table>
<f:table>
  <f:name>African Coffee Table</f:name>
  <f:width>80</f:width>
  <f:length>120</f:length>
</f:table>
</root>
```

Note: The namespace URI is not used by the parser to look up information.

The purpose is to give the namespace a unique name. However, often companies use the namespace as a pointer to a web page containing namespace information.

B. Standardized Semantic Web Tool

Middle layers contain technologies standardized by 3C to enable building semantic web applications.

a) RDF and RDFS:

- 1) Resource Description Framework (RDF):** It is a framework for creating statements in a form of so-called triples. It enables to represent information about resources in the form of graph - the semantic web is sometimes called Giant Global Graph. RDF is a simple language for expressing data models, which refer to objects (“web resources”) and their relationships. An RDF-based model can be represented in a variety of syntaxes, e.g., RDF/XML, N3, Turtle, and RDFa. RDF is a fundamental standard of the Semantic Web.

XML provide uniform framework used for interchange of data and metadata between applications. However XML does not provide any semantics (meaning) of data. Let see an example:

Sibsankar Jana is an Assistant Professor of Semantic Web.

```

    • <course name="Semantic Web">
      <assistantProfessor>Sibsankar
        Jana</assistantProfessor>
    </course>

    • <assistantProfessor name="Sibsankar Jana">
      <teaches>Semantic Web</teaches>
    </assistantProfessor>

    • <teachingOffering>
      <assistantProfessor>Sibsankar
        Jana</assistantProfessor>
      <course>Semantic Web</course>
    </teachingOffering>
  
```

This statement may be represented by various ways in XML.

So we need a data model like RDF. The fundamental concepts of RDF are **Resources, Properties and Statements**.

- i) **Resources:** These are objects or thing. It may be author, book, title, people, bus, hotel search query etc. Every resource has a URI.
- ii) **Properties:** It is special kind of resource. They actually describe relation between resources, for example “written by”, “age”, “title”, etc. These are also identified by URIs.
- iii) **Statements:** Its basic building block is an Object-Attribute-Value triple, i.e. combination of resources, called a statement. RDF has been given in XML syntax. Three views of RDF statement of a statement “Sibsankar Jana is the owner of the web page <http://www.sibsankarjana.wordpress.com>” are:

- a) (<http://www.sibsankarjana.wordpress.com>, <http://www.mydomain.org/site-owner>, #SibsankarJana).

We can think this triple (x,P,y) as a logical formula P(x,y), where the binary predicate P relates the subject x to the value y.



The subjects and objects (value) are nodes and arcs are predicate or properties which directs subjects to object (value). The many nodes and arcs in a graph is called Semantic net.

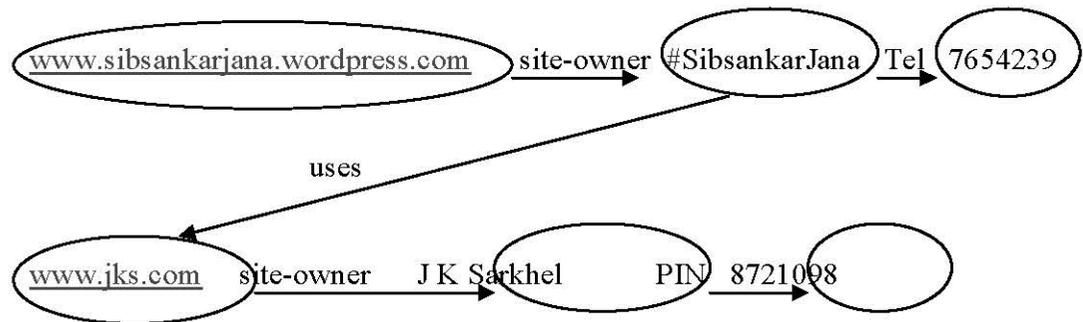
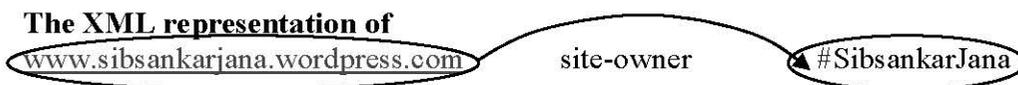


Figure-5: Semantic net

c) Graph is a powerful tool for human understanding. But it need to be understandable by machine, so XML is required for creating RDF statement. Here an RDF document is represented by an XML element with the tag **rdf:RDF**. The content of this element is a number of descriptions, which use **rdf:Description** tags. Every description makes a statement about a resource, which is identified in one of the three different ways:

- An **about** attribute, referencing an existing resource
- An **ID** attribute, creating a new resource
- Without a name, creating an anonymous resource
- A **Resource** attribute is used for empty element



looks like:

```
<?xml version="1.0" encoding="UTF-16"?>
<rdf:RDF
  xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
  xmlns:mydomain="http://www.mydomain.org/my-rdf-ns">
  <rdf:Description rdf:about=
    "www.sibsankarjana.wordpress.com">
    <mydomain:site-ownerrdf:resource="#SibsankarJana"/>
  </rdf:Description>
</rdf:RDF>
```

Namespace	XML DTD
-----------	---------

2) **RDF Schema (RDFS):** It provides basic vocabulary for RDF. Using RDFS it is for example possible to create hierarchies of classes and properties. RDF Schema extends RDF and is a vocabulary for describing properties and classes of RDF-based resources, with semantics for generalized-hierarchies of such properties and classes. Some people said that RDF Schema has a similar relation to RDF as XML Schema to XML, but in fact this is not the case. XML Schema constrains the structure of XML documents, whereas RDF Schema defines the vocabulary used in RDF data models.

In RDFS, there are Classes hierarchy and Properties hierarchy shown in the figure below:

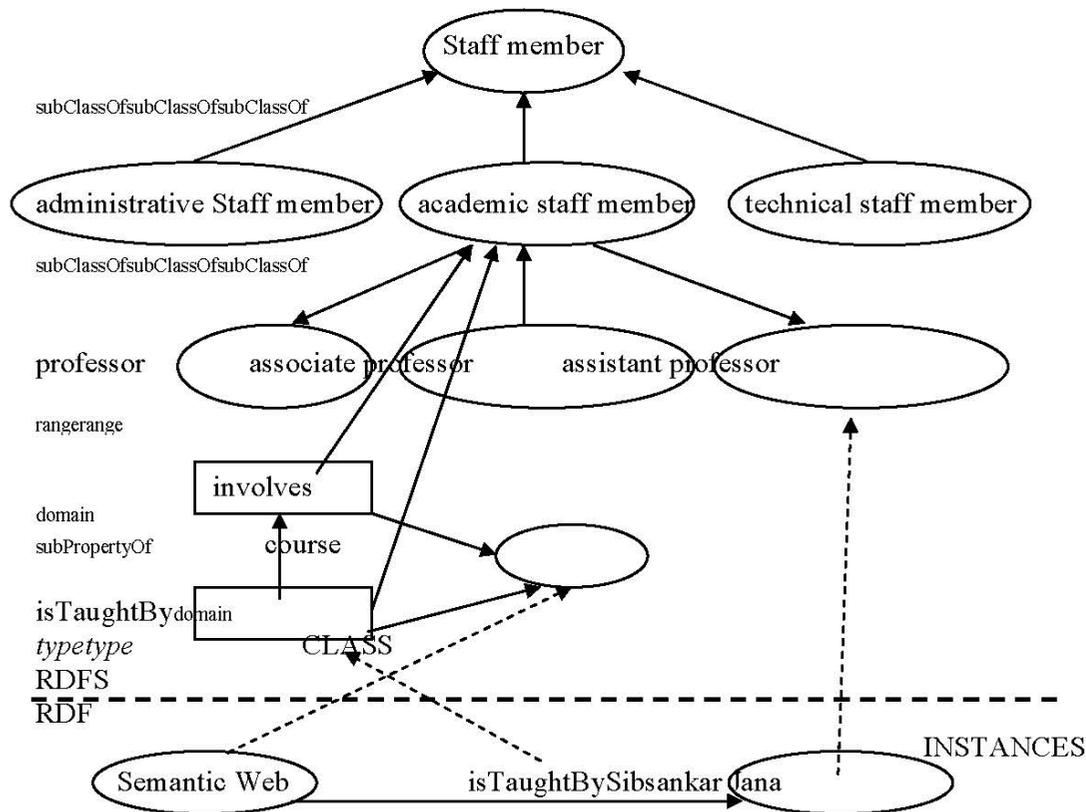


Figure-6: RDF and RDFS layers

b) Ontology Vocabulary

- 1) **OWL Ontology:** Ontology is representation step in the Semantic Web by which the domain knowledge is expressed in machine processible way. Gruber gave the definition “an explicit specification of a conceptualization”. Web Ontology Language (OWL) is the language proposed by W3C for creating ontologies for Semantic Web. The expressivity of RDF and RDF Schema that are described earlier is deliberately very limited. RDF is (roughly) limited to binary ground predicates, and RDF Schema is (roughly) limited to subClassOf hierarchy and a property hierarchy with domain and range definitions of these properties.

Web Ontology Language (OWL) extends RDFS by adding more advanced constructs to describe semantics of RDF statements. It allows stating additional constraints, such as for example cardinality, restrictions of values, or characteristics of properties such as transitivity. It is based on description logic and so brings reasoning power to the semantic web. OWL adds more vocabulary for describing properties and classes: among others, relations between classes (e.g. disjointness), cardinality (e.g. “exactly one”), equality, richer typing of properties, characteristics of properties (e.g. symmetry), and enumerated classes. It ultimately represents all the terms and their interrelationships which is called an ONTOLOGY.

The classes and properties elements in OWL Ontology:

- **Entity:** Ontology is basically composed of classes and the properties among them. The classes and properties are called Entity.
- **Class (Concept):** A class defines a group of individuals (instances) that belong together because they share some properties. A class may contain other sub-class. The class of all classes is called Thing. For example: in university ontology, **professor**, **assistantProfessor** and **associateProfessor** are the classes. Again these are sub-classes of **facultyMember**.

```

<owl:classrdf:ID="professor">
  <rdfs:subClassOfrdf:resource="facultyMember"/>
</owl:class>
<owl:classrdf:ID="associateProfessor">
  <rdfs:subClassOfrdf:resource="facultyMember"/>
</owl:class>
<owl:classrdf:ID="assistantProfessor">
  <rdfs:subClassOfrdf:resource="facultyMember"/>
</owl:class>

```

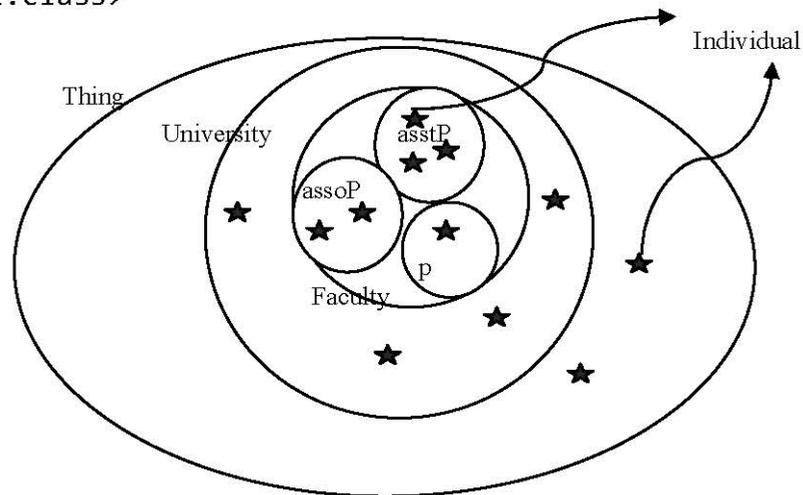
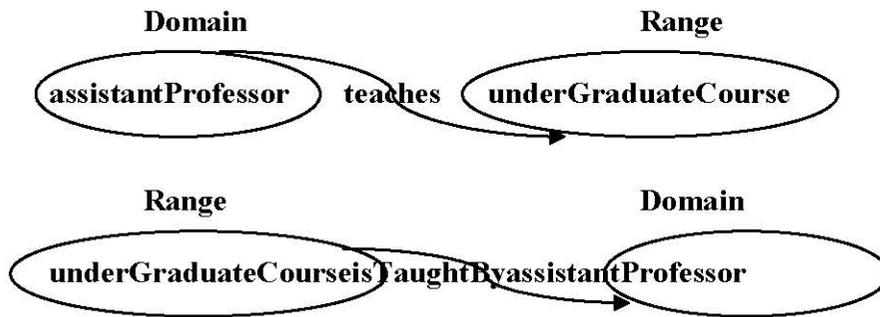


Figure-7: An university ontology

- **Property:** It is an entity, which states the relation between two or more classes from Domain to Range. Properties are of two types namely Object Property and Data Property.
- **Object Property:** Object Property states the relationship between classes of individuals. For example: **assistantProfessor** *teaches* **underGraduateCourse**.

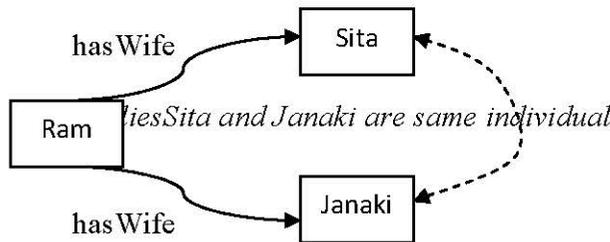


```
<owl:objectPropertyrdf:ID="teaches">
  <rdfs:domainrdf:resource="assistantProfessor"/>
  <rdfs:rangerdf:resource="underGraduateCourse"/>
</owl:objectProperty>
```

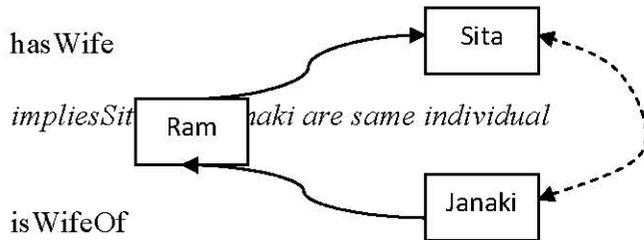
```
<owl:objectPropertyrdf:ID="isTaughtBy">
  <rdfs:domainrdf:resource="underGraduateCourse"/>
  <rdfs:rangerdf:resource="assistantProfessor"/>
</owl:objectProperty>
```

Other aspects of Object Property

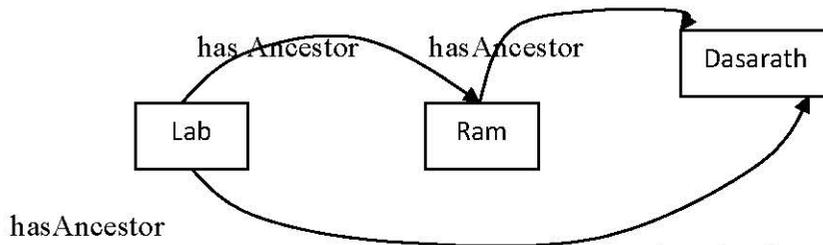
- **Sub Property:** In case of Pizza ontology hasTopping and hasBaseare two sub-object properties of hasIngredient
Example:
 - topObjectProperty
 - hasIngredient
 - hasTopping
 - hasBase
- **Inverse Property:** teaches andisTaughtByare two inverse properties of each other.
- **Functional Property:**



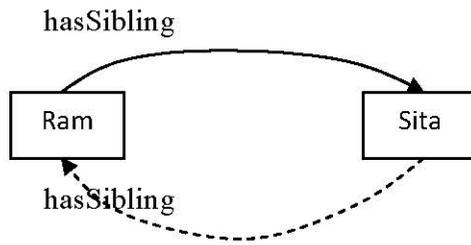
▪ **Inverse Functional Property:**



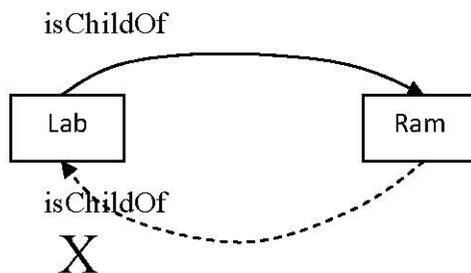
▪ **Transitive Property:**



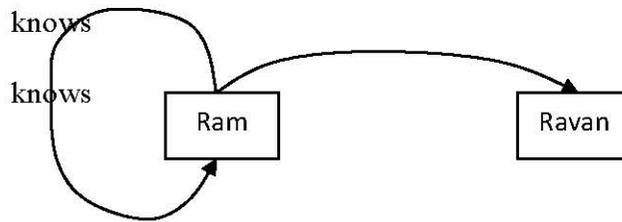
▪ **Symmetric Property:** Ram is related to Sita then Sita is also related to Ram.



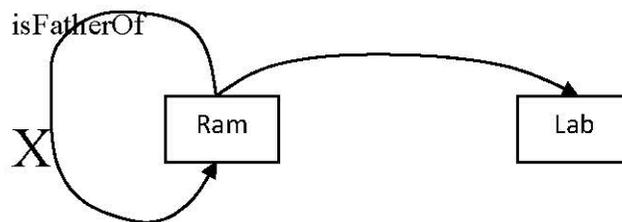
▪ **Antisymmetric Property:**



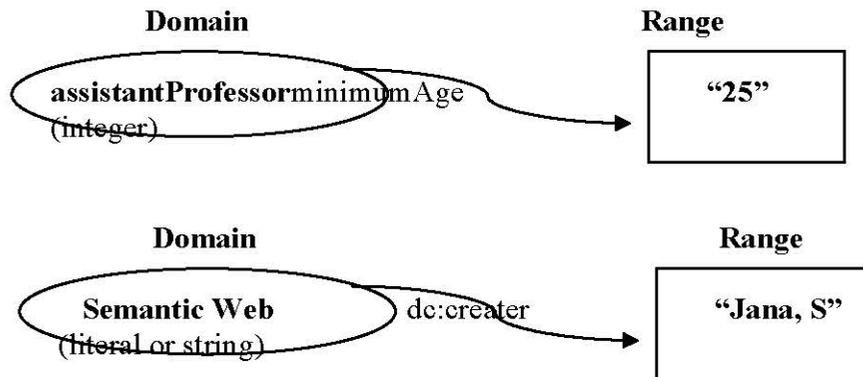
- **Reflexive Property:** First one knows himself/herself then knows other.



- **Irreflexive Property:**



- **Data Property:** Data Property expresses the property of a class of individuals such as name, age, e-mail, phone, URL etc.



There are 3 sub-languages of OWL:

- **OWL Full:** The entire language is called OWL Full. It has fully upward-compatible with RDF both syntactically and semantically.
- **OWL DL:** OWL DL mainly based on Description Logic. It has strong reasoning ability but does not have full compatibility with RDF. It is a subset of OWL Full.
- **OWL Lite:** It is subset of OWL DL. It excludes enumerated classes, disjointness statements, and arbitrary cardinality. It is easier to grasp for users and easier to implement for tool builder.

- 2) **DLP:** It is based on Descriptive logic. It is the intersection of OWL and Horn logic (used in Logic Programming) and serves as a common foundation.
- 3) **SPARQL:** It is a RDF query language - it can be used to query any RDF-based data (i.e., including statements involving RDFS and OWL). Querying language is necessary to retrieve information for semantic web applications. SPARQL is a protocol and query language for semantic web data sources.
- 4) **RIF:** It is a Rule Interchange Format. It is important, for example, to allow describing relations that cannot be directly described using description logic used in OWL. RIF is the W3C Rule Interchange Format. It's an XML language for expressing Web rules that computers can execute. RIF provides multiple versions, called dialects. It includes a RIF Basic Logic Dialect (RIF-BLD) and RIF Production Rules Dialect (RIF PRD).
- 5) **Logic rules:** The logic rule is used to enhance the ontology language further and to allow the writing of application-specific declarative knowledge.

Example: $\text{widow} = (\text{woman} \wedge \text{married}) \wedge \text{hadHusband}$

Or

$(\text{woman} \wedge \text{married}) \wedge (\neg \text{hasHusband})$

C. Unrealized Semantic Web Tools

Top layers contain tools that are not yet standardized or contain just ideas that should be implemented in order to realize Semantic Web.

- a) **Cryptography:** It is important to ensure and verify that semantic web statements are coming from trusted source. This can be achieved by appropriate **digital signature** of RDF statements.
- b) **Proof:** It involves the actual deductive process as well as representation of proofs in the web languages (from lower levels) and proof validation.
- c) **Trust:** Trust to derived statements will be supported by (a) verifying that the premises come from trusted source and by (b) relying on formal logic during deriving new information. It will emerge through the use of digital signatures and other kinds of knowledge, based on recommendations by trusted agents or on rating and certification agencies and consumer bodies.
- d) **User interface:** It is the final layer that will enable humans to use semantic web applications.

5 Conclusion

The web in which data in the web pages are so structured, organized and tagged that it can be read and understood directly by computers is called semantic web. Here web of data can be processed by machine. The use of semantic technologies in developing library portals facilitates users to search, access and retrieval of learning resources. Again we can also apply semantic web technologies in developing digital libraries. SEKT project is an attempt to integrate semantic web technologies with digital libraries. These semantic web tools will help users to retrieve exact information/documents through the understanding of the meaning of the documents by the computer. This semantic web-enabled digital library will increase the use of electronic information resources and hence will help to reduce paper documents.

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Essence of Evaluating e-Resources Usage in Scientific Libraries & Return on Investment (ROI) Analysis

Sidhartha Sahoo

Research Scholar, College of Library & Information Science, SMIT, Berhampur University, Odisha
Email: sidharthanci@gmail.com

Rabindra Kumar Mahapatra

Associate Professor & Head, Dept. of Library & Information Science, Tripura University, Tripura

***Abstract:** This paper presents the concept of ROI and challenges and opportunity of its implementation in scientific and research libraries. The essence of ROI in current scenario is very significant for the library and information managers to justify the amount spent for the subscription of scientific information resources. The paper discusses in details about usage statistics, standards, ROI formula in relation to electronic resources usage and also glimpses on the measures to be taken by the scientific libraries to enhance the usage of their e-resources. Integrated approaches to calculate ROI along with challenges are also briefly discussed.*

***Keyword:** Return on Investment (ROI); Electronic resources; Cost benefit analysis; Usage statistics; Evaluation*

1. Introduction

The increasing costs of electronic resources and online database services are major concern for a scientific and research libraries. As a result, it is essential to carefully measure and evaluates the use of these online resources. The library should adopt suitable methods to enhance the usage of these resources so that, it will help the librarian to justify the investment made for acquiring these resources. The definition for Return on Investment (ROI) varies depending on the context and it is frequently expressed as income received as a percent of the amount invested in the asset.

2. Literature Review

In the year 1999-2000, The Association of Research Libraries (ARL) took the initiative to establish the E-metrics working group under the auspices of the “new measures initiative” to focus on issues related to measurement and assessment for electronic resources and services. Baker and Read (2008) surveyed how research libraries work with vendors’ usage reports, how the data are used, and which data are most useful to librarians in managing electronic resources. Lack of standards and inconsistencies in the usage data were identified as issues in effectively preparing the data for further analysis. It was noticed that more time was spent acquiring, reformatting, and manipulating the data than on actually analyzing them. Kato S. (2004) reported that vendor usage statistics vary from vendor to vendor and highlighted the activity of COUNTER and main features of the code of practice. COUNTER provides credible, compatible and consistent usage statistics of electronic resources. He also analyzed ICOLC and NISO for measurement

of e-resources and provided guidelines for use G. W. Welch (2005) studied NISO Z39.7 library standards and analyzed web site statistics of the University Library of North Carolina at Charlotte as a member of a task force team on web statistics. He recommended that usage of library generated web pages is a useful indicator to get a complete picture of the efficiency of the electronic services provided by the library. These statistics are useful in analyzing the effectiveness of the design of the library's website, leading to refinements for navigation and generating traffic, leading to better website management and decision making. Library Journal reports (LJ2007, 34) that Sushi is another development that came into being when ANSI approved NISO's new standard called Standardized Usage Statistics Harvesting Initiative (SUSHI). Bucknell (2008) suggested it is impossible to make even moderate cuts in journals budgets without inflicting serious damage to an institution's access to journal articles, with serious implications on research. Both libraries and publishers benefit from the Big Deal, so it is essential that pricing remains affordable. Because of the cost involved in acquiring or licensing them and specificities of lack of a physical material attached to them and due to access over computer networks predominantly, it is much important to know how these e-resources are being used by the users and up to what extent. Another aspect to be stressed is the relatively easier means to study the e-resource usage due to the electronic footprints left by users and systems which can be easily tracked: a feature unheard of with the usage of information in traditional forms like print and microform, though "to use usage statistics as an absolute criterion for judging value is dangerous and misunderstands the scholarly system" Singleton (2010). Carol Tenopir (2011) in her study "Beyond usage: measuring library outcomes and value" primarily discussed the explicit and derived value of academic libraries. Result of the study shows that for every dollar invested in the library faculty attribute many more dollars returned in grant income through more successful grant proposals. Christine Urquhart, Jenny Turner, (2016) in their study on critically review methods of impact assessment and economic analyses is a comprehensive study. The study found that Terms for library assessment (outcome, output, impact, value and benefit) vary among different sectors. The study is helpful and gives insight into the ROI Analysis. Mani, M. et al., (2019) study on e-resources usage revealed that 78.3% of are aware and used e-resources. The study found that the primary use of e-resources by respondents are for research purpose(53%). The study also unfold that, "17.3% are using e-resources to improve professional competence, 39% of the respondents felt that lack of training as a key constraint for the effective use of e-resources and 35% of the respondents are highly satisfied with the present e-collection of the library. Singh, S., & Pandita, R. (2019) in their study on ROI of IITs Libraries presented a study which "aims to assess the Returns on Investment (ROI) of the twenty leading libraries of the Institutes of Engineering and Technology in India in the form of institutional research output". The results of the study revealed that "Institutes of Engineering and Technology in India concentrate more on procurement of electronic resources in their libraries, spending nearly three-fourth of their budget on the procurement of electronic documents mostly in the form of online journals and eBooks". The study gives an insight into the importance of libraries and the part these sub-institutions' play in the overall ranking of their institution

3. Types of E-resources Subscribed by Research Library

There are three major categories of e-resources which are of importance in the context of a scientific and research libraries:

- i) e-journals or electronic journals- electronic equivalents of print journals/serials or journals only appearing in electronic format;
- ii) e-books or electronic books- which are monographs available for electronic access like e-journals,

- iii) e-databases- full text, bibliographic, citation, etc. databases holding a wide variety of information in single platform, E-collection of standards, technical specifications, reports, patents

4. Essence of Evaluation of Electronic Resources

Evaluation of electronic resources in libraries is an important and a crucial activity. The major areas of interest in e-resource usage measurement are as

- To develop/frame policies for the acquisition of e-resources
- Collection development decisions based on usage data
- Identifying reasons for the use and non-use of electronic journals and databases
- Usage requirements of different category of users- scientists, researchers, students
- To assess the influence of e-resources on research and academic productivity
- Analyze the requirement of training and orientation programmes to enhance usage of e-resources
- Justification of budget/expenditure occurred toward procuring the e-resources
- To sustain the library services and activities
- To study information seeking behavior of the user community

5. ROI Formulas and its Effectiveness

ROI formula is complex one and varies across the study. There is no such standard formula to calculate ROI values. Few of the studies to calculate ROI values are mentioned below

Betsy Kelly , Claire Hamasu & Barbara Jones (2012) in their study used a formula to calculate Return on Investment (ROI) value. Their study suggested that any ROI greater than 1% is good and indicates that the value of benefits provided exceeds the cost to provide them.

The formula for ROI is as

$$\text{ROI\%} = \frac{\text{Value of benefits} - \text{Total costs to produce benefits}}{\text{total cost to produce benefits}} \times 100 =$$

Luther, (2008) in his study used a formula to calculate ROI. His study co-relate the amount of expenditure occurred by the library with the number of grant awards and number of grant proposals and citations.

Grant funding received with the library's help\ The library budget

$$\frac{\left(\frac{\text{number of grant awards} \times \% \text{ of faculty who say citations are important to grant awards}}{\text{number of grant proposals} \times \% \text{ of proposals that include citations obtained through library}} \right)}{\text{average size of grant} \times \text{number of grants expended in one year}} \times \text{total library budget}$$

6. Measures to be taken to enhance the Usage & Increase the ROI Values

Libraries having ROI positive value indicates the positive outcome/impact against the expenditures occurred for the electronics resources. Maximum usage of these resources will certainly increase

the research activities and services of the parent institution as whole. The following measures should be taken by the research libraries to enhance its usage of electronic resources and yield a positive ROI results.

6.1 Electronic Resource Management (ERM) system

Electronic Resource Management (ERM) system supports in licensing, organising and better management of the e-resources. Integrated ERM system provides platform to evaluate and keep track of the usage of e-resources. Implementation of such tool in research library will support for better utilization of the subscribed electronic resources. This will also help the management to analyze and study the impact of these e-resources on the research activities of the organization.

6.2 Popularizing Subscribed E-resources to maximize the Usage

Research libraries are required to adopt new communications tools to reach out maximum users group. Web based electronic display board will not only aware the user about the library e-resources but also increases the potential to attract the users to library services. Making aware about the avail content using social platform will certainly impact the usage.

6.3 Open accesses journal and open educational resources

Though it is improbable to replace commercial electronic resources with the open accesses content, however, all the library should emphasized in identifying open resources in their respective research domain and encouraging users to use such open sources content to use for their research activity. This will also help library to manage their budget effectively.

6.4 E-resource collection development policy and guideline

Individual libraries should formulate clear policy to build and develop the e-resource collections with keeping mind of their core services and research area. It is very crucial to identify the least used e-resources and take measure to replace those with relevant resources.

6.5 Extending e-resources beyond Library Wall

Scientific libraries should extend the facility to access the resources content irrespective of the location and time. This move will provide opportunity to scientist, faculty, researcher and students of research libraries to maximum usage of the subscribed electronic resources for their research activities. Ultimately, it will gain maximum returns on the investment what libraries do for procuring these electronic resources content.

6.6 Dynamic Library Portal to push e-resources Information

Integrated library portal along with all e-resources information certainly serve as gateway to the scientific information. Incorporating the e-resources content in web OPAC will also result in increasing the usage of the electronic resources. Library portal should be interactive and more functional with all the user centric features.

6.7 Impact of e-resources and ROI Analysis on Research Grant and Publications and Awards

Project and research grant received by the institute to measure ROI. Research publications by the individual scientist and faculty is required to be analyzed to calculate ROI. Awards and recognitions are reflection of the work carried by individual as well organization. There need to be analytical study how the library contribute to the organization in obtaining such recognitions.

6.8 Consortia of e-resources

Consortiums are found to be the major source of obtaining e-resources collection for scientific libraries. Each participating institute is required to study minutely the impact of resources on their research activities. Member institutions should be given flexibility to adopt pick and choose, pay per view methods while selecting the e-resources.

6.9 Upgradation of ICT Infrastructure and Adoption of New Technology

ICT infrastructure had impacted the usage of electronic resources to the great extent. Hence, it is essential for scientific to improve their existing ICT infrastructure for providing better user services. Dedicated internet connection with modern computer facility to be provided so that users minimize the download time for e-journals and other online resources.

6.10 Specialized Training for the Library Professional to Effective way of handling e-resources

Library professional should expose to training programme relate with effective way handling electronic resources. Sophisticated searching and information retrieval skill or techniques is must for the professionals to handle the e-resources smartly.

7. Conclusion

Critical evaluation of e-resources usage allows library managers to assess the cost, the content provider's reliability and, most significantly, the resource of research libraries ' authority to share knowledge and continuously enforce best practices in the evaluation of e-resources. Research library should adopt modern communication tools to increase accessibility to its services of e-resources and databases. Integrated approaches to ROI analysis and assessment of the impact of e-resources on institute research activities is need of the hours for library and information professionals. Library managers and professionals should well trained to analyze the e-resources usage date and derived meaning full inference from these statistical data.

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Designing a Prototype Integrated Framework for Libraries

Dr. Sukumar Mandal

Assistant Professor, Department of Library and Information Science

The University of Burdwan, Burdwan – 713 104

Email: sukumar.mandal5@gmail.com

Abstract: *At the present time libraries are facing the challenges posed by a diverse and rapidly expanding information universe. Increased user expectations for faster and easier access to relevant information go hand in hand with institutional demands for increased operational efficiency. Integrated library system required to makes it easier for housekeeping operations in a library. Barcode is a part of housekeeping operation. The process of library automation in different aspects also helps to make better use of existing library services and staff. It allows for the improvement of library in the variety, amount and quality of materials that are available in the library's collection. This paper explores a new barcode interface for libraries. It designs the barcode interface by using the PHP high level programming languages and also using some HTML tags in home page. It also uses the Code-128, which is one of the important standards in barcode creation. Another important standard is FPDF for making the barcode in a single page or multiple pages in PDF format, which is most user-friendly and easy to display interface for printing the barcode. The main objectives of this paper are to (i) explore the possibility of generating 65 barcodes in a single A-4 size paper; (ii) print out the single barcode on a single page; (iii) generate the barcode from the CSV or EXCEL format and (iv) generate the barcode from starting number to end number in a single page or multiple pages. Metadata is one of the important concept in the field of digital technology throughout the higher education as well as research environment. Digital resource management is possible through open source standard and tool. This paper has select the metadata standard like Visual Resource Association (VRA) Core. Now the methodology is very simple to perform and add the different items in this system. Integrated this VRA Core metadata framework with the Omeka open source software for the better management of library resources. Directly import the YouTube from the websites regarding the library and information science with metadata also for the better and easy retrieval of these resources among the information seekers. Open archive request results is retrieved from this interface. The whole system is developed on Ubuntu operating system. Apart from these it also explore two important new components in integrated library management and retrieval system such as bibliographic data access from the library web pages and bibliographic data visualization in Koha OPAC for easy display the right information and their report of different items available in Koha database.*

Keywords : *Barcode interface; Omeka; Bibliographic data visualization; YouTube Collection; Koha and VRA Core graph View.*

1. Introduction

Libraries have a strategic interest in the tools and technologies that facilitate the discovery of and access to the resources for the communities that they serve. Creating a rubric of core functionality and rating two discovery layers based on criteria in four main categories: general features and functionality. The fast technological development in recent years, particularly in the area of digital, multimedia and telecommunications, have significantly chaged the way generate, collect, organize, present, disseminate, share and use information. These have sharply increasing the alternatives of fast and effective access

to information of all kinds. This will certainly have a significant impact on the contemporary role of all types of libraries. The libraries will include all the processes and accommodations that are the backbone and nervous system of libraries. Cataloguing is one of the crucial things in any type or size of a library. Most of the libraries are using the manual cataloguing but some library using the machine generated cataloguing. Therefore, such classical or traditional tools and techniques have to be revised and enhancing in the field of digital media and file formats. One of the most immensely colossal issues in engendering digital libraries will be the building of digital accumulations. Conspicuously, for any digital library to be viable, it must eventually have a digital amassment with the critical mass to make it genuinely subsidiary. One thing digital libraries will not be is a single, consummately digital system that provides instant access to all information, for all the students of college libraries and also from anywhere in the world. Learning is an inevitable and indispensable for each an every community in the society due to increasing the tools of information communication technology in the learning environment. In anyhow, increases the computer learning technologies among the users community including students, young people, researchers, teachers and different information seekers both the social and educational lives. It can easily manage wide range of videos with educational largest collection of videos on the Internet. These videos are easily import into the institutional digital repository for viewing the default education deliver by the popular person in a particular area. Generally YouTube is an excellent website which consists of thousands of YouTube both the short or long videos. Most of the academic libraries are highly involved in building institutional repositories of the institution's in different items like books, papers, theses, and other works which can be digitized or were 'born digital'. Repositories are important in different insitutions because it can manage the open access resources for related with journals and other electronic resources. It is provides sophisticated search interface to find the digital resources which avaiable in this repositories. Institutional digital repositories can easily manage by the open harvesting tool like OAI-PMH which helps to access the open access documents and it also possible to search the specific resources from the particular repositories. It is fully support the metadata and search engines including Google Scholar, Yahoo! and Scirus can also use OAI-PMH to find these deep web resources. With perpetuated ameliorations in book handling and presentation technologies such as optical character apperception and improvement of alternative depositories and business models, digital libraries are rapidly growing in popularity. Just as libraries have ventured into audio and video amassments, so have digital libraries such as the Internet Archive. Web Content Management system is also an important aspect in online digital collections which helps the users of different departments in an effective and efficient way. Over the past few years the incresing of web resources of different organizations to publish and communicate the information via the web link. In this paper the important things is that the online digital collections is possible by content management system which can helps to create and publish the library resources. Advancements in the field of research and development has led to technologies such as; distributed computing, content management, data mining and processing, all of which fulfil a range of the users needs. The peregrinate from localised computing platforms to distributed web technologies has been caused by, among other factors, the take-up of commodity of different computer and network components predicated on more expeditious hardware and sophisticated software. Barcode generation is one of the important tasks in libraries. Integrated library system consists of two parts such as first one is housekeeping operation and second one is information retrieval system. Barcode is a part of housekeeping operation and it helps to retrieve or identify the resources from a particular library (Manjunath & Pujar, 2002). Apart from these it also gives the modern facilities such as bibliographic data visualization in Koha OPAC, bibliographic data access from library web pages for the better access and retrieval of relevant information of different items.

2. Review of Related Works

A barcode special sign is a parallel field of changing distance from side to side bars and spaces. “Symbology” is the limited stretch of time used to make, be moving in the clear, certain rules specifying the way that facts is made a rule into the bar and space distances from side to side (Singh & Sharma, 2015). Apart from this some symbol can only encode the numbers which is known as numeric symbol. On the other hand Code-128 fully supports the ASCII character set (Mavreas, 2000). Barcode can help the library staff in the library for the aspects of issue and return in both the machine and manually. Often the staff of a library can easily manage the resources which are available in a shelf. Barcode technology was found to be suitable for stock verification in the library (Rajendiran & Bhushan, 2006). A bar code reader decodes a bar code by scanning a light source across the bar code and quantifying the intensity of light reflected back by the white spaces (Preradovic & Karmakar, 2012). The knowledge that can be made a rule on the barcodes is rather limited and for this reason it is up to the person in the libraries to come to a decision about what knowledge they need to barcode for good at producing an effect putting one’s hands on of group and for better operation of arms (Jeevan, 2000). The comparison of metadata standards is to be made on the basis of the some well known tools and standards. This study shows a detailed analysis of the metadata standards available worldwide and it will help in comparing and adopting the required standard for the institutional digital repositories (Anil Hirwade, 2011). This paper also shows how the proposed approach is distinct from the Dublin Core format crosswalk in re-contextualizing semantic meanings and their relationships, and further provides four new sub-types for mapping description language (Chen & Ke, 2013). This paper only study the Wordpress for easy implement in different libraries for the better management of digital resources (O’Neill, 2016). The approach addresses metadata normalization in the context of web resources. The automatic classification approach accounts for matches within hierarchies, aggregating lower level matches to broader parents and thus approximates the practices of a human cataloger (Khoo & et.al, 2015). The purpose of this paper is to introduce digital librarians to a new encoding standard for developing semantically rich controlled vocabularies which will enhance searching of digital content (Cantara, 2006). This paper looks at the problems of producing accurate and effective metadata that describe preserved resources without incurring a prohibitive cost overhead (Brindley, Muir & Proberts, 2004). In this paper only discuss the popular metadata standard SWORD for the development of interface of different institutions (Lewis...et.al, 2009). Linking the different repositories is the main objectives of this paper which opined by Awre & Swan, 2007 to identify the suitable models both the technical and theoretical aspects of end-user related services if four areas user community requirements, roles and responsibilities, technical architecture and infrastructure, and business and management models.

3. Objectives

The main objectives of this paper are explained as follows:

- (i) To explore the print out 65 number of barcode in a single A-4 size paper, generate the barcode from the EXCEL CSV format into the simple barcode format, generate the single and starting to end number barcode from this barcode interface, and create a single file for easy working of any library;
- (ii) To explore the YouTube collection for developing the institutional digital repository and easily import the YouTube directly into the repository through Dublin Core and Visual Resource Association Core metadata standards;
- (iii) To display the VRA Core Graph view in user interfaces for easy management of different types of

resources and their usage statistics;

- (iv) To explore the bibliographic data of Koha access from the library web pages;
- (v) To display the bibliographic data visualization in Koha OPAC.

4. Methodology

The methodology is very simple and practical because it depends on LAMP architecture in Ubuntu operating system. The programming system has been executed based on HTML and PHP programming language. And FPDF (Free Portable Document Format) has been used for displaying the result in PDF format. One barcode standard (Code 128) has also been used to identify the code bar very distinctly with dipper illustration. This whole integrated framework is developed through Ubuntu operating system because it is more reliable and multitasking operating system. Apart from this it also requires the Firefox Web Browser to execute and run the integrated folders from the web server under the var/www in Ubuntu operating system. Harvesting YouTube from the Web environment by using the open source software Omeka and it is also possible for showing the VRA Core graph view of different keywords available in the database. Bibliographic data access and data visualization is possible by using the html and google loader for display and searching the different fields and subfields.

5. Designing Interfaces

The important designing interfaces are to be made for academic libraries in different sectors. These can be easily accessed and development in the following areas as follows:

- Barcode Generation Interface
- YouTube Harvest Interface
- VRA Core Graph View Interface
- Bibliographic Data Access of Koha from Web Page
- Bibliographic Data Visualization in Koha OPAC

5.1 Barcode Generation Interface

Integrated framework is one of the core concepts in this paper. The entire interface can be accessed from here and it also runs in any operating system. Just copy the barcode folders and paste into the local server for access to the barcode interface. It can easily generate the barcode because it is more user-friendly. The innovative thing in this paper is that there is no requirement of installation to run the barcode interface. It can run without installing this software. It can help to all the library professionals. It is possible to change the header section in the barcode interface and write here institutional code for each and every library. This is also an important task in the automation of any libraries and 65 barcodes writing and printing systemically and logically. Using this, 65 numbers of barcode for the books in library can be generated and printed in a single page. This can save the time of the library professionals and staff also. After clicking on the generate option it will create the PDF file where barcodes appear. It is possible to print out the barcode for libraries. Some libraries want to print a barcode in single PDF format. This framework also solves this problem to create the barcode for the libraries. Library can generate their single barcode from the interface displayed through the single window based barcode generation interface. One has to write the barcode and change the header section, and finally click on the 'generate' button. Lot of books are available in a library. Barcode management of these books is a very difficult task. But this barcode

interface solved this type of problem. Just write here starting barcode number and end barcode number and it will generate the designated number of barcodes within a few seconds or minutes depending on the number of barcodes desired and the barcode interface relating to the starting and end number of barcodes. Here, for example, write 15000 and 20000 for starting number and 20000 for end number, respectively, and click on the generate button. It will easily generate all the barcodes on single or multiple PDF files. It is also time-saving and user-friendly. One can import barcode from the Excel or CSV format into this interface. Most of the libraries were writing their barcode in Excel format because Excel format is more user-friendly, so that this interface directly managed the barcode and it presents the Excel or CSV format in barcode interface for different libraries.

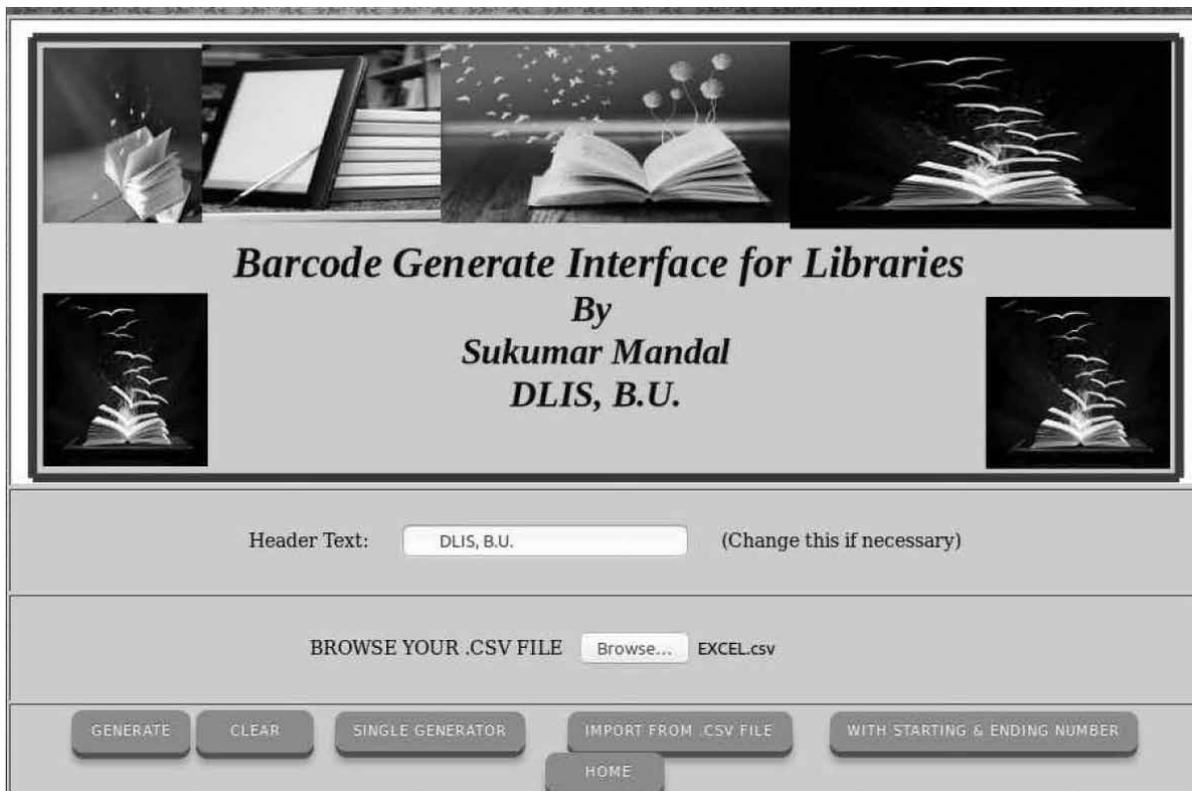


Figure – 1: Barcode generate interfac

Now, click on the barcode generate option it will easily create the PDF file with barcode. Figure – 2 presents the barcode in PDF format from the Excel format or CSV format.



Figure – 2 : Reslts of Barcode interface

5.2 YouTube Harvest Interface

Development of institutional digital repository in the field of library and information science education is very simple for each and every library professionals. This research paper has successfully import the video of library and information science education into the institutional digital repository for managing and retrieving the YouTube resources among the users. However, the process and methodology is very simple and user-friendly for importing the YouTube by using only four fields such as YouTube URL, collection, responsibility, and public visibility. Finally click on the import option and coming YouTube into this repository. The Figure-3 is represents the import YouTube option for access the video in the field of library and information science. This is the admin interface of institutional digital repository by using the open source software omeka high performance.

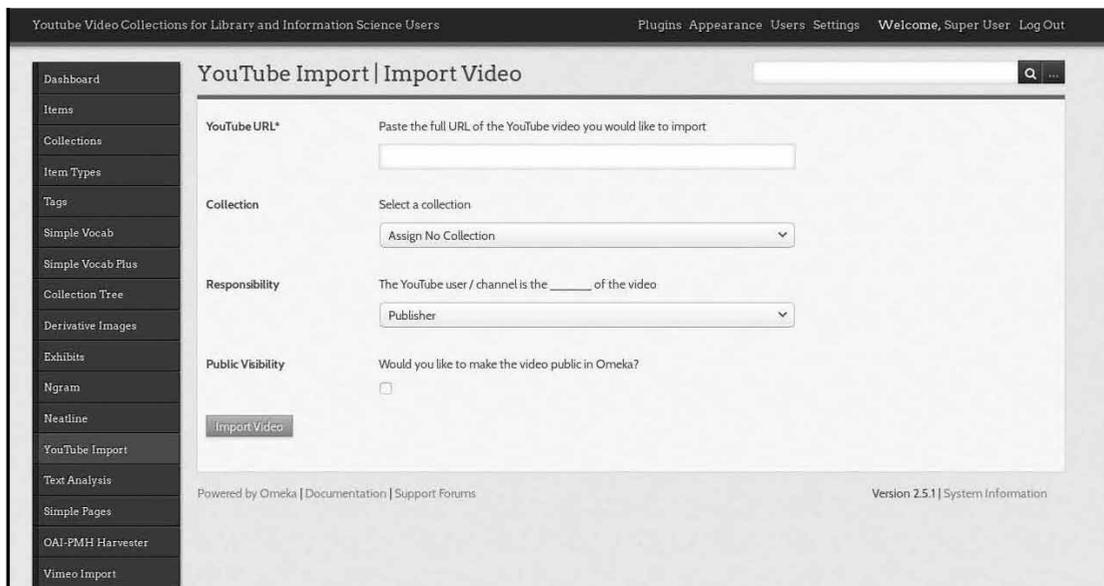


Figure – 3 : Import YouTube video interface

5.3 VRA Core Graph View Interface

Text analysis can be made on the basis of five components such as name, text element, sequence element, sequence type, and sequence range. For the formation of this graph a time range is first selected. For this following particular graph a time range i.e the appearance of terms between 2000 and 2018 or simply 18 years has been counted. Therefore, this graph will represent the different terms those have been appeared within that time period can be easily understood as well as their frequency status can equally be visible and countable. Now, from the following graph it may be described that between the said time period (i.e 2000-2018), the terms like web, semantic, lis, date, cloud, winisis, and library have appeared in different numerical value and hence, their the frequency status can equally be calculated and shown in the Figure – 4.

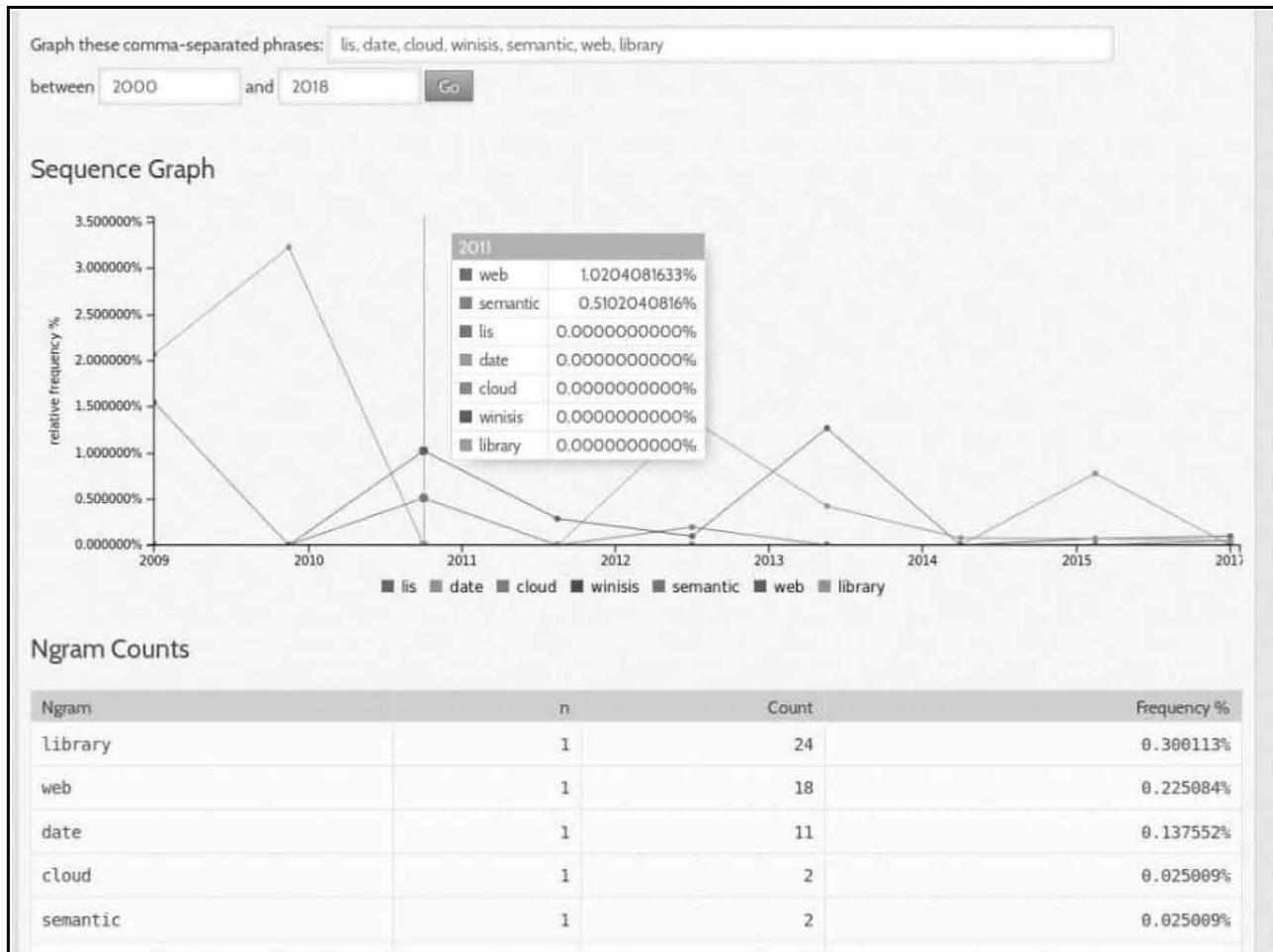


Figure – 4: Sequence Graph Interface

5.4 Bibliographic Data Access of Koha from Web Page

Bibliographic data is one of the important aspects in the field of integrated library management and retrieval system for academic libraries. Now, generally access these types of data from the Web OPAC interfaces but this paper has successfully explore how to access bibliographic data from the institutional web pages for easy access and retrieval of different types of documents available in Koha. This is possible by using the html language in the Figure – 5 as follows:

```
<html>
<head><title>lis</head></title>
<br>

<body bgcolor="#33ffda">
<font color="blue" size=+3>Bibliographic Records Search Interface for Library Users</font>

<form name="searchform" method="get" action="http://localhost:8002/cgi-bin/koha/opac-search.pl" target="new" id="searchform">
<input id="transl1" name="q" type="text"><p>
<select name="idx" id="masthead_search">
<option value="kw">Keyword</option>
<option value="ti">Title</option>
<option value="au">Author</option>
<option value="su">Subject</option>
<option value="nb">ISBN</option>
<option value="se">Series</option>
<option value="callnum">Call Number</option>
<option value="bc">Accession No.</option>
</select>
<input value="Search" id="searchsubmit" type="submit">
</p></form>

</body>
</html>
```

Figure – 5 : html code interface

This is the results page of bibliographic records available in Koha database and just write the keywords and click on the search button it will retrieve the relevant data from the Koha OPAC interface. Apart from this it also retrieve the other fields also such as Author, Title, Subject, Call No., Accession No, Series and ISBN (Figure -6) for the better management of academic library resources available in integrated library system software Koha.

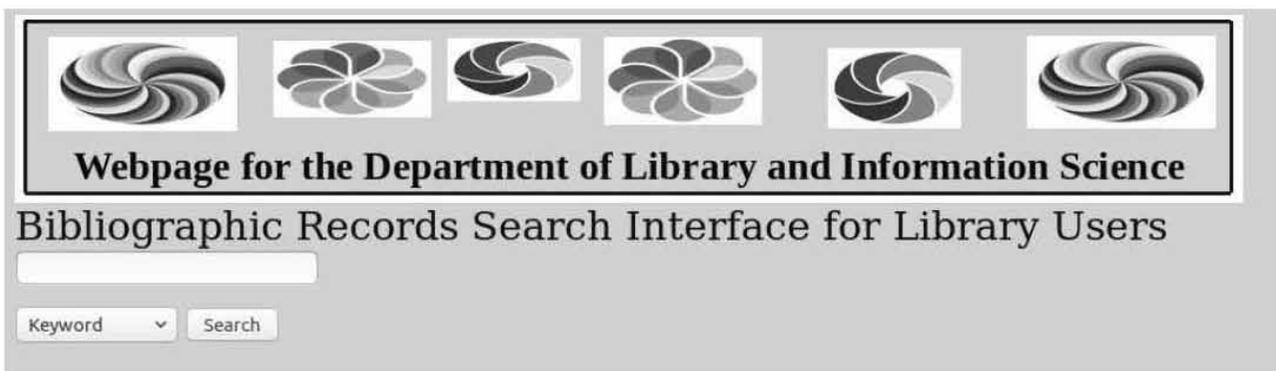


Figure – 6 : Koha Bibliographic records search interface

5.5 Bibliographic Data Visualization in Koha OPAC

This is also an important concept in the field of library automation. The process is very simple to create this type of bibliographic data visualization. Now, this can be explained in brief first download the html code and loader.js file from the google html code. This code is to be placed on opacmainuserblock under the Koha global system preferences. It is very excellent and nice working in Koha OPAC for the management and data visualization of different fields such as Author, Title, Subject, Fiction, History, English, and etc (Figure - 7). The number of facets increases on the basis of size of collection of academic library. This can save the time of the reader as well as library professionals also.

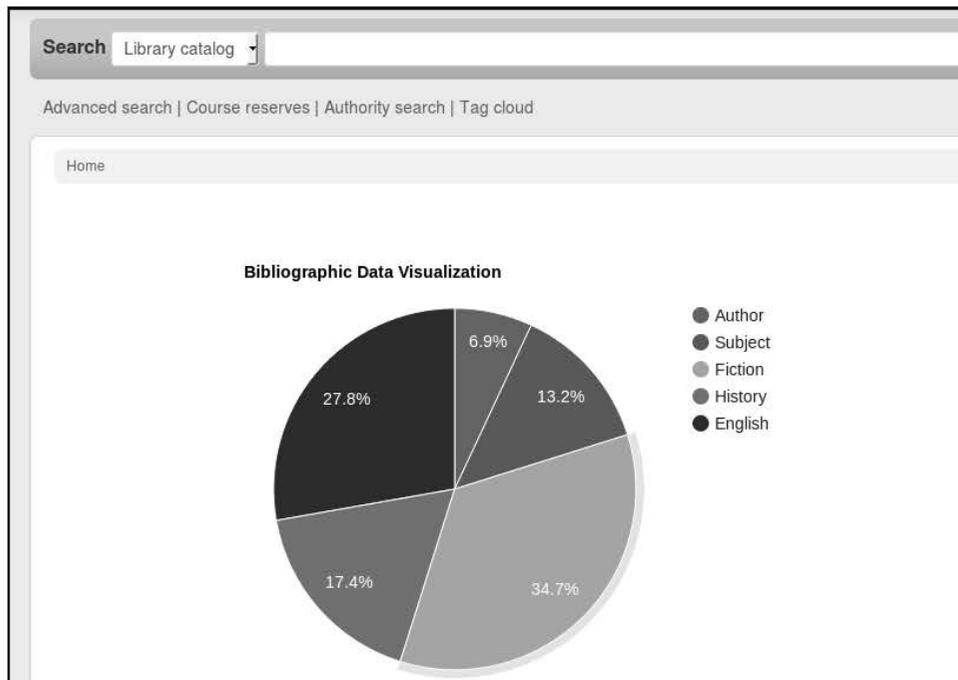


Figure – 7 : Bibliographic data visualization in Koha OPAC

Conclusion

This barcode generating system can produce four different modes of barcode generated products such as Single barcode product, Full page barcode, Excel or CSV imported barcode, Starting to ending barcode. Therefore, this integrated framework approach is an easy approach method where a librarian can easily implement and generate the barcode without bothering the critical programming method in the library at any point of time and of any point in sequence number. Even this system of barcode generation can be easily made in any institution, where this barcode is kept any particular computer and if that computer is connected with other computers of the same institution through LAN connectivity, then the barcode generation can easily be made by using any computer there. Therefore, this integrated framework approach is very flexible; time independent; machine independent; librarian independent; and library independent. Therefore, from general librarian to expert librarian, anyone can use this barcode system and make the library effective and efficient towards achieving better library automation environment. Graph visualization is also possible through the ngram view and sequence graph for display the terms frequency which available in the Omeka database. This is very important to the users because its a innovative educators for identification, collection, organization, and dissemination among the users. YouTube has massive possible to increase the multiple resources in Internet. From the above discussion

it is clear that users have easily access the YouTube in the field of library and information science education for enhancing their knowledge and research capability in different areas. This single window based interface is very user-friendly to each and every user of any institutions for effective and efficient knowledge construction and memory building. Big data and semantic is also supports mainly in two areas such as bibliographic data visualization in Koha OPAC and bibliographic data access from the library web pages. Obviously, it can save the time of the readers and library professionals also.

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A Theoretical Model of Design of the Prototype of Integrated Content Management Systems

Dr. Biswajit Das

Librarian, Sundarban Mahavidyalaya, Kakdwip - 743347
E-Mail : bdas103@gmail.com

Prof. (Dr.) Parthasarathi Mukhopadhyay

Professor & HOD, DLIS, Kalyani University
E-Mail : psmukhopadhyay@gmail.com

***Abstract:** This article explains the processes of developing the prototype and the hard core activities. Core technological elements envisaged for designing the theoretical model include Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH) as protocol for metadata harvesting in OAI_DC and MARC-XML encoding environment. It needs to be configured as discovery layer of the Integrated Content Management Systems (ICMS). It is evident that the users of the libraries are running from one interface to another for searching relevant resources. This article describes the issues factors, and processes associated with the design of the theoretical model of a prototype library Integrated Content Management Systems.*

***Keywords :** ICMS, ILS layer, IDR layer, DMA layer, VuFind, MARC 21, DCMES, IEEE-LOM, OAI/PMH*

1. Introduction

Libraries have a strategic interest in the tools and technologies that facilitate the discovery of and access to the resources for the communities that they serve. Creating a rubric of core functionality and rating two discovery layers based on criteria in four main categories: general features and functionality. The fast technological development in recent years, particularly in the area of digital, multimedia and telecommunications, have significantly changed the way generate, collect, organize, present, disseminate, share and use information. These have sharply increasing the alternatives of fast and effective access.

2. Traditional Library vs ICMS :

Traditional Library	Integrated Content Management Systems
Traditional library information systems, such as library catalogs and databases, are referred to as search systems. Search systems supports homogeneous environment i.e. processing of records that are described in the same way, follow the same standard data formats, and often related to a set of given formats. These search systems expect searching literacy from users and sometimes provide searching aids like online thesaurus.	A discovery system integrates various internal and external resources including services like document delivery, citation manager tools, and hold or photocopy requests. In many cases discover includes many additional services like social network support, browsing by many keys, personal search environment, full-text indexing, query forwarding, auto suggestions, and linking with other external sources for on-the-fly service generation.

3. Integrated Content Management Systems Framework : This article is intended to provide a suitable conceptual framework of Library Discovery System. The most important conceptual dependencies and pathways in understanding the framework centre round on its supporting layered structure indicating what kind of components can or should be built and how they should interrelate. This framework will provide a technical infrastructure which has high performance, is scalable and robust, and delivers a platform to support in designing the theoretical model of LDS. Two important components are represented by the framework of the LDS: (1) Content or resources which regulate the prime factor, and (2) suitable technologies that make possible to harvest, index, search and retrieve the content for the users of the libraries. The user interface platform features have provided a user friendly environment (Breeding, 2015).

4. Requirements and Specifications : The appearance of open source software and open standards are helping libraries to initiate library automation, to improve institutional digital repositories, to build learning object archives and discovery service so on. Different software is being used in libraries. There are three types of layer of LDS like ILS layer, IDR layer and DMA layer. Koha open source software has been selected as ILS layer, DSpace has been selected as IDR layer and Greenstone selected as DMA layer and VuFind selected as LDS for the purpose of this article. The user interface has to be submitted queries, receive results, and make content selections from an array of locally processed and globally available resources through a single-windows user search interface. By using library discovery system, it is not only save the time of the users but also help to find out relevant resources systematically and rapidly.

5. Methods and Materials

5.1 ILS Layer : Koha is an integrated library management system that was originally developed by Katipo Communication Limited of Wellington, New Zealand for the Horowhenua Library Trust (HLT), a regional library system located in Levin near Wellington. Koha is based on LAMP architecture. Koha is established in a number of technological achievements. Such as use of Web 2.0 tools, integration of authority format and bibliographic data format, availability of OPAC interface in 25 different languages, implementation of Z 39.50 server and OAI/PMH compatibility, in built support for social networking tools, Web-based self issue, use of open standards for different modules and granular system administration facilities (Mukhopadhyay, 2015).

5.2 IDR Layer : DSpace: On March, 2000, Hewlett-Packard Company (HP) and the MIT Libraries are collaborated over two years to create the DSpace digital repository platform. HP Labs and MIT Libraries released the system worldwide on November 4, 2002, under the terms of the BSD open source license. As an open source system, DSpace is now freely available to other institutions to run as-is, or to modify and extend as they require meeting their local needs. From the outset, HP and MIT designed the system to be run by institutions other than MIT, and to support federation among its adopters, in both the technical and the social sense (Das and Mal, 2010).

5.3 DMA Layer : The Greenstone digital library software is an open-source system for the construction and presentation of Information collections. It builds collections with effective fulltext searching and metadata-based browsing facilities that are attractive and easy to use. Collections of information comprise large numbers of documents (typically several thousand to several million), and a uniform interface is provided to them, existing collections range from newspaper articles to pop music collections. It is widely used Internationally, Greenstone supports collections in many different languages. Greenstone

CD-ROMs have been published by the United Nation and other humanitarian agencies for distribution in developing countries (Sreekumar and Sunita, 2007).

5.4 Integrated Content Management Systems: VuFind open source library discovery software. VuFind, based on AMP architecture, is written in PHP and uses Apache-Solr as its default open source text retrieval search engine. VuFind is being used in different parts of the world for a variety of purposes is recognized as a viable option for libraries at a low price (Breeding, 2015).

6.1 Selection of Metadata Schemas : There are different types of metadata standards, we are selected MARC 21 bibliographic and authority format for print resources, Qualified Dublin Core Metadata Elements Set (DCMES) for digital resources, IEEE-LOM for learning objects.

6.1.1 Print Resources : MARC21 Bibliographic and Authority Formats : The Library of Congress, the standards and the support office at the National Library of Canada maintain the MARC21 formats. The five MARC21 communication formats are widely used standards for the representation and exchange of bibliographic, authority, holdings, classification and community information data in machine readable form.

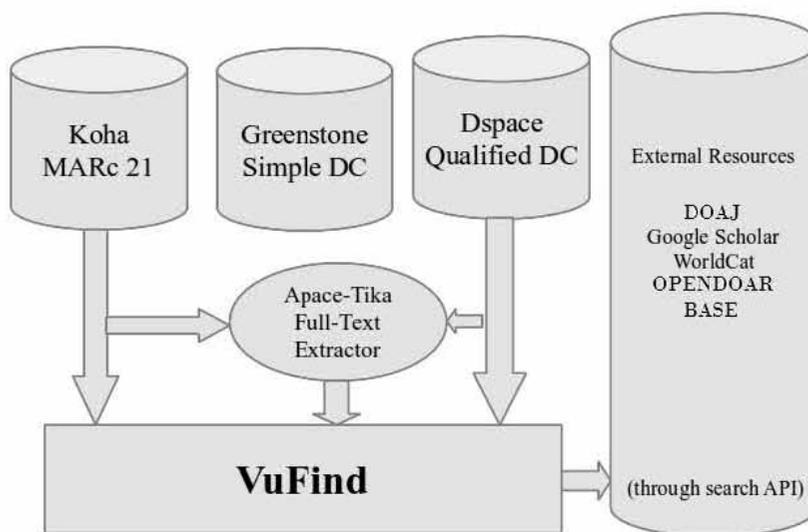
6.1.2 Digital Resources : Qualified Dublin Core Metadata Elements Set (DCMES) : The Dublin Core Metadata Initiative (DCMI) is an organization providing an open forum for the development of interoperable metadata standards that support to a broad range of purposes. The discovery of information across the vast common of the Internet is delayed to different in terminology and descriptive practices from one field of knowledge to the next (Mukhopadhyay, 2015).

6.1.3 Learning Objects : IEEE-LOM : IEEE - LOM organizes these elements have been divided into nine categories such as : general, life cycle, meta-metadata, technical, educational, rights, relation, annotation, and classification. The dublin core and all the elements are optional. There are no requirement fields and no minimum cataloging requirements. Like qualified Dublin Core, IEEE - LOM uses controlled vocabularies to define terms when populating a field.

7. Design of Integrated Content Management Systems: Discovery layer provides a search interface for end-users for discovering, displaying, and interacting with the collection of heterogeneous content from various sources in library systems by creating a single searchable index (Sadeh, 2008) VuFind software, an open source software, has been selected as discovery layer for the purpose of this article. It needs to be configured as discovery layer for LDS. VuFind, based on AMP architecture, is written in PHP and uses Apache-Solr as its default open source text retrieval search engine. VuFind is being used in different parts of the world for a variety of purposes is recognized as a viable option for libraries at a low price. VuFind can retrieve data (in oai_dc or marcxml formats) from ILS layer and repository layer seamlessly through OAI/PMH as its standard for harvesting and subsequently data are thrown to Apache-Solr using the SolrMarc indexing tool for efficient indexing. In order to incorporate the multiple functionalities of discovery interfaces, it has become imperative to configure the discovery layer. The major steps are as follows:

1. Installation and configuration of discovery layer (here VuFind) as the front-end of the LDS framework;
2. Linking to ILS (Koha) to fetch real-time item availability status into the discovery layer so that users can know the availability of books as well as availability of copies (on loan, when due etc) in the same interface;
3. Making ILS harvesting ready and fine tuning harvesting properties of the component ILS (Koha);

4. Making Discovery layer ready to harvest and index records from ILS component;
5. Harvesting and importing records from ILS component into Discovery layer;
6. Making IDR harvesting ready and fine tuning harvesting properties of the component IDR (DSpace);
7. Making Discovery layer ready to harvest and index records from IDR component;
8. Harvesting and importing records from IDR component into Discovery layer;
9. Fine tuning of end-user interface in Discovery layer (here VuFind) to integrated facilities like social networking, external content, and to support user friendly features like searching.



The VuFind as discovery layer and is based on OAI/PMH for harvesting resources available in MACRC 21 bibliographic and authority formats including ILS (Koha), digital resources are available in Qualified Dublin Core and Simple Dublin Core (from Dspace and GSDL respectively). The Vufind also includes open access resource services such as: DOAJ, BASE, OPenDOAR, LibGen, PLoS-One, Google Scholar, WorldCat, etc. (Mukhopadhyay, 2017).

8. Conclusion : This article explains the processes of developing the prototype and the hard core activities having three fundamental conceptual views: Contents identified for the purpose of the internal contents of libraries—such as, Integrated Library System (ILS), Institutional Digital Repository (IDR), and Digital Media Archiving (DMA) as well as external contents —such as, E-resources, open archives journals and publications. LDS has been viewed as the mashups of many technologies and tools. Core technological elements envisaged for designing the theoretical model include OAI-PMH as protocol for metadata harvesting in OAI_DC and MARC-XML encoding environment. These standards are used for de-duplication processes, Central index for collection of de-duplicated metadata, use of OpenURL-compliant Link resolver software to work with the vast majority of information resources, and Relevancy algorithm. It needs to be configured as discovery layer of the ICMS.

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Green Library: the demand of the era

Atin Nandi

Deputy Librarian, Central Library, IIT Kharagpur

E-mail: atin@library.iitkgp.ac.in

***Abstract:** People of all walks of life need to be conscious to maintain healthy atmosphere to protect the world from being possible destruction. Librarians also should actively take part in the procession towards Going Green for the purpose of survival. Precautionary measures are to be taken to minimize the release greenhouse gases or any pollutants into this fragile atmosphere adopting the oath of – Reduce, Reuse and Recycle; else life will be extinct for forever. The paper discusses with the concepts of Green Library and several related concepts namely environmental depletion factors, Net-Zero Energy Building, essential steps towards construction of Green Library, Green Building certification agencies, the role of the Central Library, IIT Kharagpur towards Green revolution etc. Data on Green Library obtained from Scopus and Web of Science has also been discussed in a nutshell.*

***Keywords:** Green Library; Green Building Rating System; Zero Energy Building.*

1. Introduction:

Books of libraries of distance passed were chained and common people had no access to those treasures unlike so called rich men of the then society. With the passage of time the concept of library has changed to a great extent. In modern age a library is no longer a store house of book, but the user have access to plethora of valuable information which are lying stored in libraries. With the advancement of Science and Technology the earth is getting engulfed with different hazardous materials making life threatening condition. The planet will ceased to exist if we do not think very seriously about Sustainable Development. The Green concept was conceived in the former parts of 1990s. Library readers spend considerable time within the four walls of a library. Library personals responded to the urgent demand of creating a safer and greener world for wellbeing of users.

2. Environmental degradation:

The environment is getting degraded because of numerous reasons namely - global warming, ozone layer depletion, loss of natural resources, biodiversity, accumulation of e-waste materials. All these create turmoil resulting into increase of temperature in the atmosphere, melting of glaciers at faster rate, increase level of sea water, falling down of ground water level, Mangrove forests are getting extinct day by day. The density of greenhouse gases is becoming more and more because of unwanted human activities. Greenhouse gases like Methane, Carbon dioxide, Nitrous oxide, halocarbons – trap heat in the atmosphere. Chlorofluorocarbons (CFCs) and other halogenated ozone depletion substances (ODS) exposed to open atmosphere are responsible for ozone layer depletion resulting numerous health hazards like - skin cancer, eye cataracts, disruption of immune system, genetic disorders etc. The natural resources are alarmingly depleted very rapidly is taking place very rapidly due to – overpopulation, excessive consumption and wastage of water, deforestation, mining, soil erosion, contamination of natural

resources etc. Ecosystem is getting disturbed due to loss of biodiversity. Accumulation of E-wastage is also causing awful situation.

3. Review of Literature:

Several articles regarding Green Library and related concepts have been discussed for this study. (Walker,2020) in his blog “100 Ways to Make Your Library a Little Greener” gives detail information in a lucid style. (Attia, 2018) in his book explains Net Zero Energy Buildings vividly. (Meher and Parabhoi, 2017) describe about the overview of Green Library with special reference to India.

4. Green Library:

A Green Library is such a library which tries to diminish all sorts of negative impacts upon the environment and also maximize indoor environment quality. A Green Library will try to minimize carbon foot prints. Adequate emphasis is to be given upon – environmental depleting factors, purified air quality, renewable resources, biodegradable products, cost effectiveness, vegetation, and conservation of resources. Green Libraries are also known as Sustainable Libraries. Green Libraries ensures several benefits – improvement of very good quality of life, attract patronage, and keep the earth safe for the forthcoming generation. Various Green libraries are located at the different corners of the globe. Some examples are – Seattle Central Library (USA), Minneapolis Public Library (USA), National Library Singapore, Foshan Library (China), Stadtbibliothek Bad Oldesloe (Germany), Anna Centenary Library (India).

5. Zero Energy Building:

It is alternatively known as zero net energy (ZNE) building or net-zero energy building (NZEB). Wikipedia defined it as – “total amount of energy used by the building on an annual basis is equal to the amount of renewable energy created on the site”. NZEB considers energy efficiency while Green Building takes into account several applications namely –waste management, use of ecofriendly materials, reduction of wastage of water and electricity etc. Hence Green Building is a wider concept compared to NZEB. A Green Building is an energy efficient building which is supposed to reduce energy consumption around 40% compared to conventional building. Initial cost for making Green Building may be high but it is more economical as it saves energy. There are four principles of NZEB. First principles reduce energy demand, Second principle improve indoor environmental quality, Third principle provide renewable energy share and the Fourth principle of NZEB reduce primary energy and carbon emissions. The first net zero building of India is the Paryavaran Bhavan of Delhi. The energy efficiency and renewable energy technologies have been deployed efficiently in this building.

6. How to make eco-friendly Green Library.

Librarians are to take vital role to make Green libraries with a very positive attitude to protect environment Series of activities are required in order to make provision for a Green Library. Some of those are as follows –

1. Natural ventilation, natural lighting, green roof tops, vegetation, generation of electricity using solar energy etc. should be there.
2. Use of plastic materials or toxic materials should be totally avoided. Biodegradable products are used.
3. Eco friendly paints to be used
4. Roofs to be suitably designed to lessen the absorption of solar heat.

5. Wooden furniture (biodegradable) should be used but not steel furniture.
6. Special types of glasses are used in Green building. Coated glass provides thermal insulation, double glass gives acoustic comfort, solar control glass highly useful for energy efficiency, transparent glass for providing natural lighting with good intensity. Double-paned windows filled up with Argon or Krypton gas may provided better insulation. Use of curtains may be avoided for such smart windows; which will inevitably save money.
7. Arrangement is made for renewable energy.
8. Green roof tops, Green walls are also constructed to create cool atmosphere.
9. Roof should be built in such a fashion so that it can reflect solar heat instead of absorbing.
10. Plantation of big trees to make cool atmosphere.
11. Bio toilets are extremely useful to diminish the wastage of water
12. Air purifying plants are to be kept at different corners.
13. Laptops should be procured instead of Desktop as the former is more energy efficient.
14. Ceiling fan as well as pedestrian fan should be used instead of AC system
15. Users should be advised to avoid using lifts / elevators (if they can) to save unnecessary wastage of power.
16. Computers should be in sleep mode when those are not used.
17. OPAC should be used instead of card catalogue.
18. Preference is to be given on e-prints instead of acquiring print materials.
19. Power saving LED bulbs should be used
20. Motion sensors may be used to save power
21. Eco friendly pesticides to be used for pest-control operation
22. Stress is to be given to use Eco-friendly toner and cartridges
23. Bye-back policy may be introduced to diminish the accumulation of e-wastes.
24. Reduction of wastage of papers as far as possible. It will economic as well as it will diminish the amount of deforestation.
25. Recycled papers are to be purchased. Recycled materials uses 99% less water

7. International Organization for Standardization:

The International Organization for Standardization (ISO) was founded on 23 February 1947. The ISO 14000 series of standards was introduced in 1996 in order to help companies to reduce industrial waste and environmental damage. ISO/TR 11219:2012 is relating to planning of library buildings for all type of libraries irrespective of any country. The section 2.95 deals with sustainability aspect.

Building construction in one of the important parameters for achieving Sustainable Development. The Sustainability aspects in Building construction has been discussed in ISO 21929, ISO 21930, ISO 21931 and ISO 21932.

8. Green Building Certification Agencies:

The certification for Green Building is actually given by Green Building Certification Agencies. In order to make Green building certain prerequisites are to be followed which is popularly known as Green Building Rating System. Different countries have their own rating systems. As for examples – UK follows Building Research Establishment Environmental Assessment Method (BREEAM), Leadership in Energy & Environmental Design (LEED) is popular in USA, Green Globes in Canada. Japan follows Comprehensive Assessment System for Environmental efficiency (CASBEE). The standard Green Mark is followed in Singapore. Various other countries including India are also following LEED. LEED meticulously judge on site of location, water conservation, energy efficiency, materials and indoor air quality. India follows the following three rating systems.

1. Indian Green Building Council (IGBC): It was set up in 2001. It is the first ever rating system in India. There are four levels of rating - Certified (for best practices), Silver (for outstanding performances), Gold (for National excellence) and Platinum (for Global leadership). IGBC has licensed the LEED standard.
2. Green Rating for Integrated Habitat Assessment (GRIHA): It was set up in 2006 jointly by TERI and the Ministry of New and Renewable Energy, Government of India. GRIHA is most suitable in Indian context.
3. Bureau of Energy Efficiency (BEE): Bureau of Energy Efficiency was set up by the Government of India on 2002. BEE has developed a rating system ranging from 1 to 5 stars. 5 star labeled buildings according to BEE is most efficient buildings.

9. Initiative of IFLA:

The International Federation of Library Associations and Institutions (IFLA) is the leading international nongovernmental organization which was founded in Scotland in 1927. IFLA is encouraging library professional by offering Green Library Award. It has been started from 2016. The award is 500 Euros for the first place winner.

10. Case of IIT Kharagpur towards Green Movement:

IIT Kharagpur was established in 1951 and it is the oldest among 23 IITs. The Central Library of the institute is ISO 9001:2015 certified library. In fact it is not a Green Library, but some features have been incorporated within it. The Central Library is surrounded by big trees, and the entry point is decorated with potted plants. The users enjoy natural sunlight through its wide windows. Polycarbonate sheet on the roof top of the Annex Building allows natural sunlight to enter, which saves consumption of electricity during day time. The library is giving stress upon using energy-efficient LED lighting. The entire library is Wi-Fi enabled. Library users can bring their laptops inside the library. Smoking is not permitted within library premises. Plastic cups as well as plastic materials are not used within the IIT Campus. There are more than 120 computers within the library and users are extracting valuable resources for the purpose of their study and teaching. About 85% of the library budget is been invested for the collection development of e-resources (e-books and e-journals). This is a very big library. At the present moment there are about 12000 students (PG, UG and Research Scholars). Students are not allowed to use personal motor vehicles. Free bus services have been incorporated for the purpose of their transportation. Adequate parking spaces are there for bicycles adjacent to the library building. Installation work is going on for Compactor machines in order to keep bound periodicals. The movement sensors have been introduced (to reduce unnecessary wastage of electricity) within the corridors just

outside the library building. Compactor machines not only save space but also reduce carbon foot prints. The Central Library, IIT Kharagpur has taken some measures to reduce the wastage of papers. Online Public Access Catalogue has been introduced replacing the card catalogue, online registration forms for – Grammarly, Turnitin, Document Delivery Service etc. are available online.

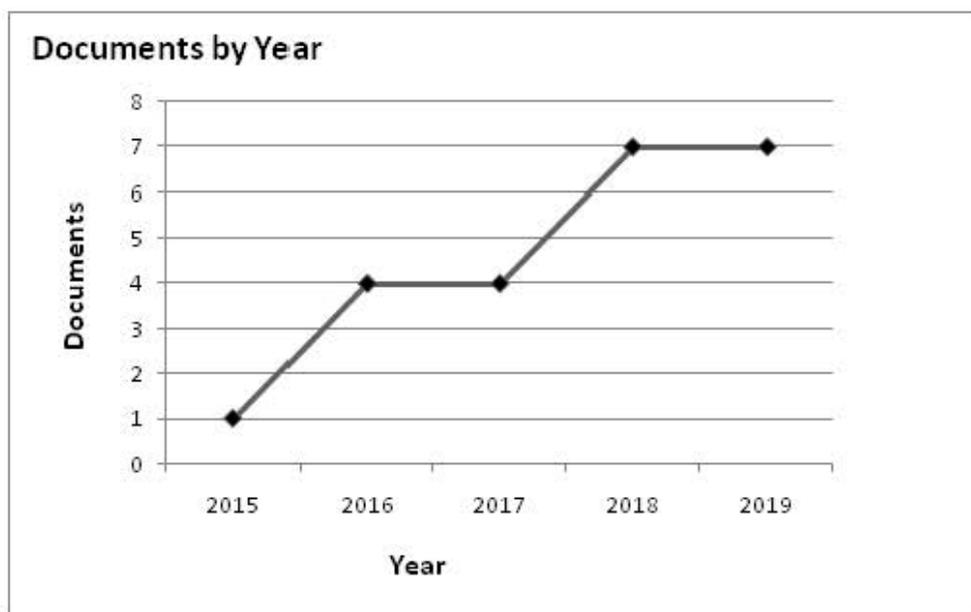
11. Analysis from Scopus Database and web of science:

Searching from both the Web of Science and Scopus database with the keywords “Green Library” limited from year 2015 to 2019 showed the following results.

Year	No. of articles in Scopus	No. of articles in Web of Science
2015	1	Nil
2016	4	Nil
2017	4	Nil
2018	7	1
2019	7	1
TOTAL	23	2

Table 1: Article published on Green Library.

The result is not encouraging at all. The line graph of the Scopus result has been shown below in the fig.1.



Scopus database is more comprehensive than that of Web of science; hence the former reflect slightly better result. Librarians should encourage the budding library professional to write more standardized journal articles topic on Green Library. Various information relating to Green concepts should get spread among library professionals through standardized articles relating to Green Library movement. This may make them think to transform their library to Green Libraries from traditional one for the well being of the e as well as next generation library users.

12. Conclusion:

This planet is moving far apart from Green because of several human activities. Sustainable development is a big challenge nowadays. The future generation as well as this planet is to be survived by adopting eco-friendly habits. Green building is the demand of this era. Green building aims to construct energy efficient, eco-friendly and healthier Green Library is the part of Green Library. Green buildings are needed to give more and more importance compared to traditional building. It is of utmost importance by the Librarians to keep their libraries clean and green. Modern librarian should think about this blooming concept so that users can spend hours together within library building without being exposed to any sort of health hazard.

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Mode of Identification of Rare Documents for their Management in Different Libraries in India: An analytical Study

Pronobi Porel

Librarian, Rabindra Mahavidyalaya, Champadanga, Hooghly, West Bengal
Email: khanpronobi@gmail.com

Dr. Udayan Bhattacharya

Professor, Deptt. of Library & Information Science, Jadavpur University, Kolkata
Email: udayanbhattacharya1967@hotmail.com

***Abstract:** A total of 20 different types of libraries in India have been taken to identify the criteria applied by those libraries for identifying rare documents. The study found a total of broad 10 criteria which have been found after study their websites, online information sources, email and telephonic conversations and physical verifications. These criteria directly and indirectly have been used for identification of rare documents. The results show that most of the libraries identify rare documents on the basis of 'age of the documents', incunabula, manuscripts and scarcity of the documents.*

***Keywords:** Rare book; manuscripts; rarity; old book; rare collection; incunabula; antiquarian book.*

1. Introduction

Libraries are curious combination of its collections. In the context of importance, it is very difficult to say which items are more important than another. Special collections are most important and they are looked after with a certain prestige. A set of identifying criteria for identification of rare books play a great role in this regard (Mann, 1972). As the libraries are important institutions to transfer country's cultural heritage from past to present, collection developments and preservation of rare documents are crucial jobs to libraries specially, to the libraries in 'national flavorus'. These collections are hard to develop and maintain because they make demands in terms of housing, staffing, and funding and expertise (Traister, D. (1983). One of the roles of a national library is the preservation of scarce, unique, and valuable research materials of the country. An academic library also preserves its valuable documents as well as its many such materials. Demand by users for old, rare and precious books is small but not insignificant. In this context, all of the libraries require to identify rare documents.

Identification of rare books is tough job as only a few documents are considered "rare" among a large collection of books and other materials. The whole activities regarding identification consist of a set of different guidelines – some of which are common to all of the libraries and rests of them are special which vary from library to library. In simple terms, books achieve a degree of rarity only when demand of those books to the people exceeds supply. Sometimes, this simple determinant based on "demand and

supply” does not satisfy many other precious or antique valuable documents. Unfortunately, there are no readymade formulas for determining rarity as there are a lot of criteria involve to it.

2 Objectives:

The main objective is to understand the applied guidelines for identification of rare books in different libraries in India. The other objectives of this study are as follows:

- (i) To know various old libraries and their rare collections in India;
- (ii) To identify criteria applied by different types of libraries;
- (iii) To identify criteria involved in high demand rare books still in existence;
- (iv) To know how the criteria differ from library to library;
- (v) To analyze comments, suggestions regarding rare as well as valuable book;
- (vi) To analyse the factors of rare books from the viewpoints from Rare Book Specialists.

3 Methodology

Only the information available in English language has been considered in this study. Many of the cases, the contents of the websites other than English language have been rejected from this study. All types of libraries have been considered for data collection in this study.

3.1 Selection of libraries

The study includes oldest libraries in India. But where there is no relevant information in the website of an old library, the study has selected to the next one. All types of libraries have been considered like national library, public libraries, academic libraries mainly university libraries and special libraries. A total of 20 libraries in India have been taken. It is found that there are no organized websites or the relevant information in some old libraries. Therefore, the selection has been completed after rejecting those libraries. The final 20 libraries are as follows.

Table no. 1: Statement showing list of libraries in India

Sl. no.	Name of the libraries	Estd. year
1	Allahabad Government Public Library	1864
2	The Asiatic Society of Kolkata	1784
3	The Asiatic Society of Mumbai	1804
4	Bangiya Sahitya Parishat	1893
5	Bhandarkar Oriental Research Institute Library	1917
6	Carey Library and Research Centre	1818
7	Connemara Public Library	1896
8	Khuda Bakhsh Oriental Public Library	1891
9	Krishnadas Shama Goa State Central Library	1832
10	National Archives of India	1891
11	National Library of India	1836
12	National Mission for Manuscripts	2003
13	Nehru Memorial Museum and Library	1964

Sl. no.	Name of the libraries	Estd. year
14	Parliament Library	1921
15	Rampur Raza Library	1774
16	State Central Library West Bengal	1956
17	Thanjavur Maharaja Serfoji's Sarasvati Mahal Library	1535
18	University of Calcutta Library	1857
19	University of Mumbai Library	1880
20	Uttarpara Jaykrishna Public Library	1859

3.2 Data collections:

The websites of various libraries have been studied for data collection. But where there is no significant data in the website, manual survey has been conducted. Sometimes, telephonic conversations or email conversations have also been performed for data collection. The study includes all types of documents i.e. books, journals, pamphlets, letters, pictures, manuscripts and so on. So it considers a border concept "rare documents" for collecting raw data.

4 Criteria:

There are so many criteria have been used to identify rare documents. The process of identification is not a science, because of a single rule cannot be applied to other documents in another library for considering rare documents. The same factors or criteria cannot be applied in every situation. It is important that rarity does not simply mean that something is old or hard to find. In simple words, a rare book is one that is important, desirable, and scarce (Porel & Bhattacharya, 2018). A number of factors can affect the scarcity of a book, including printing history, the number of copies printed or sold, and the quality of the paper and binding any controversy surrounding the book, its popularity and its genre.

4.1 Ascertained criteria:

A set of criteria have been ascertained from different national libraries, public libraries, academic libraries and special libraries in India. These criteria have been grouped in ten broader headings for ease of analysis. For example the broader heading 'Imprint' includes the followings:

- Time: Old books – definition of 'old' varies from library to library
- Place: Printed from a remote place, found in unusual areas, region etc.
- Publisher: Distinguished publishers, person as publishers, publishers of famous books etc.

Table no. 2: Statement showing ascertained criteria

1	Imprint		
	<ul style="list-style-type: none"> • Period of publication • Age of book • Incredibly old 	<ul style="list-style-type: none"> • Printed at special time • Distinguished publishers • Political climate 	<ul style="list-style-type: none"> • Printed from a special place • Religious climate • Found from unusual places

2	Scarcity		
	<ul style="list-style-type: none"> • Desirability • High demand • Inconsequential book 	<ul style="list-style-type: none"> • Limited printing • Limited publication • Non-private publication 	<ul style="list-style-type: none"> • Public interest • Related private publications • Scarcity
3	Physical aspect		
	<ul style="list-style-type: none"> • Binding • Cover design • Craftsmanship • Quality of binding 	<ul style="list-style-type: none"> • Decorated pages • Dust jacket • Physical objects • Quality of Printing 	<ul style="list-style-type: none"> • Shape and size • Special Paper • Writing materials
4	Sense of 'first'		
	<ul style="list-style-type: none"> • Best edition • First book • First book in a language 	<ul style="list-style-type: none"> • First edition • First printing from a place • First printing technology 	<ul style="list-style-type: none"> • First publication of a nation • Primacy • Special edition
5	Specialty		
	<ul style="list-style-type: none"> • Contents • Contribution to the history • Distinguishing features 	<ul style="list-style-type: none"> • Eminent artist • Eminent artist or person • Illustration • Importance 	<ul style="list-style-type: none"> • Influential book • Original sign • Press of a great printer • Relevance, controversial writings
6	Provenance		
	<ul style="list-style-type: none"> • Association • Evidence of ownership 	<ul style="list-style-type: none"> • Increased interest • Ownership 	<ul style="list-style-type: none"> • Sources
7	Classic books		
8	Incunabula		
9	Manuscripts		
10	Others		
	<ul style="list-style-type: none"> • Completeness • Condition • Historical ephemera 	<ul style="list-style-type: none"> • Important translation • Prize winner • Revised and corrected 	<ul style="list-style-type: none"> • World record

4.2 Criteria used by the libraries

For identification of rare documents most of the libraries do not mentioned the criteria in their websites. After analysed their rare documents the present study found a set of general criteria and some of the cases a set of special criteria in those libraries. Special criteria are those which have been proposed by the respective libraries.

Table no. 3: Statement showing ascertained criteria used by the libraries

Sl. no.	Name of the libraries	General and Special criteria
1	Allahabad Government Public Library	Incredibly old, incunabula, manuscript, classic book, limited publication, eminent person.

Sl. no.	Name of the libraries	General and Special criteria
2	The Asiatic Society of Kolkata	Special paper, quality of binding, classic book, scarcity, high demand, first book in a language, age of book, incunabula, manuscript.
3	The Asiatic Society of Mumbai	Special paper, craftsmanship, classic book, high demand, age of book, incredibly old, manuscript, incunabula, contents, eminent person.
4	Bangiya Sahitya Parishat	Classic book, ownership, high demand, scarcity, content, importance, writing material, age of book, incunabula, manuscript, primacy, eminent person.
5	Bhandarkar Oriental Research Institute Library	Special paper, quality of printing, primacy, best edition, contents, importance, illustration, distinguishing features, period of publication, incunabula, manuscript.
6	Carey Library and Research Centre	Classic book, desirability, primacy, limited printing, high demand, first publication in a language, age of book, incunabula, manuscript, incredibly old.
7	Connemara Public Library	Age of book, incunabula, manuscript, importance, contribution to the history, important translation, primacy.
8	Khuda Bakhsh Oriental Public Library	Classic book, ownership, high demand, scarcity, content, importance, writing material, age of book, incunabula, manuscript, primacy, eminent person.
9	Krishnadas Shama Goa State Central Library	<p>Period of publication, incunabula, manuscript, primacy, increased interest, high demand, ownership, historical ephemera, and special criteria like:</p> <ul style="list-style-type: none"> • All the early manuscripts and imprints of 14th to 17th century; • Any books on Goa and historical content about Indo Portuguese; • Pre-Liberation books and documents belonging to the Biblioteca Nacional; • Books received under the Press and Registration of Books Act, 1867.
10	National Archives of India	Association, high demand, related private publication, primacy, printed from special time, incunabula, manuscript, historical ephemera.
11	National Library of India	<p>Age of book, special paper, classic book, association, high demand, scarcity, first publication of a nation, incunabula, manuscript, historical ephemera and special criteria like:</p> <ul style="list-style-type: none"> • Books published about India and printed in India before 1860.

Sl. no.	Name of the libraries	General and Special criteria
12	National Mission for Manuscripts	Scarcity, high demand, public interest, first book, special edition, best edition, content, importance, eminent person, age of book, incredibly old, incunabula, manuscript and special criteria like: <ul style="list-style-type: none"> • Handwritten composition on paper, cloth, bark, palm leaf, metal or any other material; Document must be at least seventy-five years; • Significant scientific, historical or aesthetic value; • It excludes Lithographs and printed volumes; • Historical records such as epigraphs on rocks, revenue records; • Documents provide direct information on events or processes in history.
13	Nehru Memorial Museum and Library	Private publication, contents, eminent person, association, period of publication, incunabula, manuscript.
14	Parliament Library	Age of book, incunabula, manuscript, eminent artist, high demand, increased interest, important translation.
15	Rampur Raza Library	Age of book, incunabula, manuscript, special paper, quality of printing, classic book, primacy, eminent persons.
16	State Central Library West Bengal	Age of book, Classic book, ownership, high demand, eminent person, incunabula, manuscript.
17	Thanjavur Maharaja Serfoji's Sarasvati Mahal Library	Age of book, manuscript, incunabula, special paper, first edition, original sign, classic book, shape and size.
18	University of Calcutta Library	Classic book, sources, high demand, first book of a language, eminent persons, content, importance, age of book, incunabula, manuscript.
19	University of Mumbai Library	Classic book, scarcity, special editions, historical ephemera, first book, incredibly old, incunabula, manuscript.
20	Uttarpara Jaykrishna Public Library	Writing material, classic book, ownership, evidence of ownership, high demand, scarcity, limited publication, eminent person, content, importance, age of book, incunabula, manuscript.

5 Analysis

All of the ascertained criteria have been grouped in different 10 main heads. Each of 20 libraries has directly or indirectly used these criteria for identification of rare documents. The following table shows those criteria used by different libraries.

Table no. 4: Statement showing criteria applied by the libraries

Sl.No.	Criteria	Ascertained from no. of libraries	Percentage of library (Out of 20)
1	Imprint	20	100.00
2	Incunabula	20	100.00
3	Manuscripts	20	100.00
4	Physical aspect	7	35.00
5	Classic	15	75.00
6	Provenance	9	45.00
7	Scarcity	16	80.00
8	Sense of 'first'	12	60.00
9	Specialty	15	75.00
10	Others	6	30.00

From the above table following bar chart has been drawn.

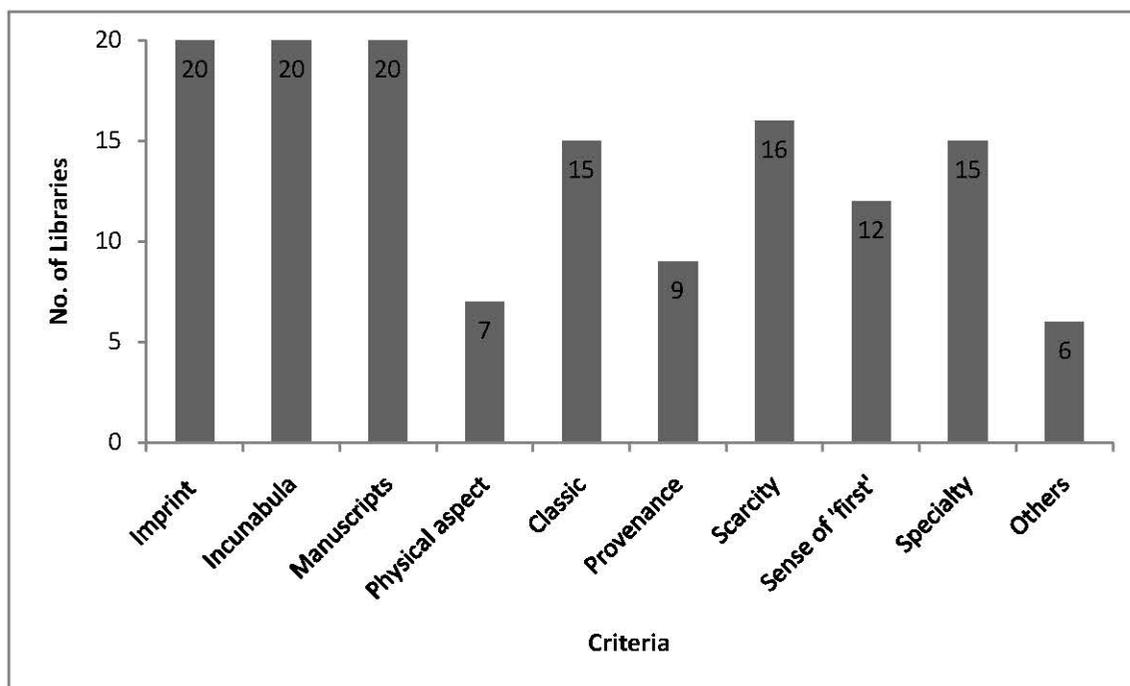


Chart no.1: Criteria wise analysis of libraries in India

Remarks: The study found an interesting fact that most of the libraries in any type identify rare books on the basis of imprint i.e. old book etc., manuscripts or they feel the scarcity of those documents. It is very shocked that many of them are very little concern about 'Physical aspect', 'Provenance' and 'Sense of 'first'.

6 Conclusion

Identification of rare documents is a difficult job without proper guidelines but it can easily be possible by following a set of guidelines. Therefore, a set of guidelines, plan, strategy or course of action always required to each of the library for management of rare documents. The identification process can be gear up by developing awareness of cultural heritage, awareness of rare documents, manuscripts and their historical importance among the users as well as common people. The LIS schools and related institutions should take initiatives for that by introducing it in their course contents or specialization on it and arrange seminars, conference, workshops in regular intervals (McCrank, 1980). The Government of India has already initiated the National Mission for Manuscripts programme for awareness and preservation of manuscripts in 2003. The UNESCO's Memory of the World Programme is another drive to safeguard the documentary heritage.

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Library and its Services towards Eco-friendly Environment

Dr. Anup Kumar Routh

Librarian, Sovarani Memorial College, Howrah
E-mail: librarianofsmcollege@gmail.com

Abhijit Pramanik

Librarian, Bagnan College, Howrah
E-mail: abhijit.pramanik.bc@gmail.com

***Abstract:** This article emphasizes on the role of library and its services towards eco-friendly environment. Library plays a vital role on creating eco-friendly environment. Library promotes its users towards eco-friendly environment. It makes people aware on the environmental pollution and disasters by providing books specific on this topic. It can also organize talk show, exhibition, screening of movie on the environment. It can arrange panel discussion. If people gather knowledge on environment they can save the environment. Library plays a vital role on creating eco-friendly environment.*

***Keywords:** Library Services; Eco-friendly Environment*

1. Introduction

A library is a social institution. It plays vital role in making a healthy, prosperous, sustained society. Environment is a big issue now a days. Environment in which we belong to should be eco-friendly. Government of each country, international organizations are working for preserving environment. In India, the University Grants Commission sponsored many refresher courses on environmental topic. The subject Environmental Science or Environmental Studies is not merely for the study of the students of these subjects. These subject and its nearby subjects are mostly coming under the scanner of different subject. People of different fields giving attention on environment, environmental management and environmental ethics. There is no question on involvement of different subject discipline in environment. “A good library provides services as per the user’s need, a better library provides services as per the user’s need and in anticipation and creates needs of the users and a best library provides services as per the user’s need and in anticipation and creates needs of the users and develop the imaginative power and expands the idea plane of the user and inspires to work in verbal and notational plane”(Routh and Ahmed, 2017). So library extends its hands towards the community people. Common people do not have a sound knowledge about eco-friendly environment. If a library take initiatives for making awareness it will be very effective.

2. Why Eco-Friendly Environment is needed?

We, the human being are playing a crucial role of making our environment. Our predecessors’ works and culture was very much down to earth. But industrial development, excessive population, need of

inhabitant and obviously the greedy inhumanity of man creates our earth full of pollutants and unhealthy. We are suffering from diseases and others environmental effects which lead to a painful future. In this perspective we need to take initiatives of making eco-friendly environment or preserving natural environment for our survival. We know “**Survival of the fittest**” from Darwinian Evolutionary Theory. A library occupies a space so it should be located and maintained in an eco-friendly environment. Being maintaining its environment a library is also playing very important role in its community of making awareness on environment and environmental issues like eco-friendly environment, disaster management, sanitation etc. In true sense without eco-friendly environment our future is unsecured.

3. Library and Eco-friendly Environment

A library in its own space it should be acted as a mentor of eco-friendly environment, and besides its space it should be acted as a mediator of the same.

1.1 Special Collection on Eco-friendly Environment

It should emphasis on developing special collection on eco-friendly environment. This collection should be placed in the area where readers can get ease to access the collection.

1.2 Eco-friendly Preservation and Conservation of Library Resources

Books and other library resources preservation is very important for a library. Library preserves cultural heritage for the posterity. Library resources are damaged by various factors. Damages caused by human being may be controlled by proper library literacy programme, using security measures like CCTVs and etc. But environmental effects and caused by insects and others animals should be checked. And there should be some policy. It is well known that only maintaining some measures for library stack area can lessen the factors involved in damaging library resources. Even today most of the libraries preserve their books by using chemicals which have side effects, which kills biological balance. Instead of using heavy chemicals, library should emphasis on natural elements which have very less side effects or no side effects. Bio-Pesticides and other compounds for conservation are to be used. Library authority has the power controlling over these issues.

1.3 Eco-friendly Library Building and Services

At the time of construction of a library building, the authority must include a blue print of eco-friendly library building. And an established library should consult the construction engineer so that it could be ungraded into an eco-friendly building. If a library building is perfect it can assure better services to its users. Construction engineering is providing foresight measures depending upon the location of the library and the need of a particular library. A healthy environment and services attract its users to get connected with the library. Library users are of various age groups. Sometimes their requirements get different. Library building and infrastructure should be maintained eco-friendliness and user-friendliness.

1.4 Reference Service, Referral Service and Information Service

Library provides reference service, referral service and information service as a regular practice. If the community people have enquiries about eco-friendly environment library should be prepared to provide these services to the users for the betterment.

4. Library and its extension services

Besides library's day to day services and work, a library extends its services from time to time. It extends its services to its community also. It should emphasis on the extension services which may lead to betterment of environment as well as the users and the community people.

1.1 Books and other library resources exhibition

Book exhibition may be done on different occasions. In a regular basis library exhibits its new arrivals in a particular place. Besides this, to commemorate different environmental issues and celebration of different world and national days specified for nature, environment, hygiene, sanitation etc. library may take initiative for book exhibition. For this it may also includes inter-library loan and loan from other institution or from an individual who is/are working for the environment and environment-related field. When people involve in certain way, the awareness building is possible to some extent. Library daily issues may also be increased by exhibiting library books and other materials. It has a great influence over the users. Unknown books and uncovered area of study make users more affinity to the library.

4.2 Talk Show

Library may arrange Talk Shows on different days as and when it can. It will be more focused if this is celebrated on the days which have national or international importance. The theme of the talk shows may vary. Library should incorporate some talk shows on environmental issues. And it should be opened to all. Emphasis should be given on the participation of users from younger generation. If the younger people get involved in different environmental issues, the movement of eco-friendly environment will get momentum. Talk shows will be more effective if the selection of speaker may be done from different age group or generation.

1.3 Awareness Campaign

Everybody does not everything. But minimum awareness on different social and environmental issues must be secured. Government takes different awareness campaign from time to time. A library itself may organize awareness campaign of different issues and may work to promote government programme. Library can provide its space, i.e. auditorium, or open space and other infrastructure to succeed this kind of programmes. When people come to the library to attend an awareness campaign, interest may be increased on that subject domain. If library takes a part in the movement of eco-friendly environment, it gets its users and community people to whom it serves. Library as a Social Institution plays this role effectively. Expertise on the particular topic must be secured. And there should be some specified period for open discussion and interaction with the speaker.

1.4 Writing Competition

A library may organize writing competition on different issues along with eco-friendly environment. Writing competition on different issues secures more readings by the users. It is also increases library's daily issues and use of library resources. If the authority selects the theme or topic of writing on environment or eco-friendly environment it becomes a part the said movement. It also attracts community people to the library.

1.5 Sit and Draw Competition

Sit and Draw is a very interesting event which ensures a very good numbers of participants. If a library itself or in association with other institution or group organizes sit and draw competition it can gather many users or non-users of the library. A library may take the benefit of making awareness on different issues through different competitions like sit and draw competition. Environmental issues as a theme encourages users and non-users to think about environment as well as eco-friendly environment. A library should use its different channels to encourage, remind the users and other community people about the nature and natural systems and the effects of environment on human being.

1.6 Seminar and Open Discussion

Organising seminars and open discussions on different issues have immense influence on community people. If a library takes environment issues like eco-friendly environment not only for the library but for also community be saved. All social and cultural institutions should have their own dutifulness over environment. This type of seminar must include library professionals so that profession of different institution get more knowledgebase and can utilize in their own area. A library may share its resources - books and other reading and learning materials, infrastructure and human expertise to make more awareness on environment and eco-friendly environment.

1.7 Other extension services

Library may organize open debate, folk song competition, drama, wall magazine etc. on environmental issues. Community people of the rural area and urban area like folk song. If a message is given through the folk song it is more acceptable than delivering an expertise lecture to the community people. So a library may turn its extension services for making awareness on environment.

5. Students participation

Students are doing different types of project work as a part of their courses. If a librarian or library officer works as a liaison officer, among the library and schools and colleges of the community area or different departments of its mother organization, he or she may take many opportunities of serving the community towards green environment and other issues. Students who are engaging project on environmental issues may send a copy to the library through their institutional head. Library should preserve their works. These projects could ensure awareness among community people. And at the same time students may feel happy as their projects come into the users table. If possible students may be given space and time for delivering lecture or demonstration to the community people. It strengthens the relationship among community people.

6. Conclusion

Library, in modern and post modern times is not merely confined with the sharing of books. It works as an important wing of academic institution, its multi faceted role to serve community is really amusing. Library is a space of cultural exchange also. If the authority thinks of evolving eco-friendly environment and if involvement is secured then a library play a crucial role in building eco-friendly future.

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Services towards Differently Able: Role of LIS Professionals in New Era

Arup Kr. Bhattacharya

Librarian, Acharya Prafulla Chandra College, New Barrackpore, Kol- 131
E-mail: arup_1475@yahoo.co.in

Dr. Nilima Paul

Librarian, Mrinalini DattaMahavidyapith, Birati, Kol-51
E-mail: nilima28paul@yahoo.co.in

***Abstract:** Information is a primary and fundamental right of all people of the country, including differently able persons and their information need must be fulfilled. Like normal people, differently able persons also require latest information to update, to educate, to empower, to employ and to be independent. Differently able persons have equal right to access the social, political, and economic life which includes not only physical access but access to the same tools, services, organizations and facilities for which everyone pays. The paper aims to give a brief description of information services to be provided by libraries to differently able library users making use of information technology. The paper further highlights the special equipment's and services that the library professionals are expected to provide to create a barrier free environment in a library and Information Centre. There are many technological innovations and advances that are meant for the normal as well as the differently enabled persons.*

***Keywords:** Differently able; Disability; Library; Access of library resources; ICT, LIS professional*

1. Introduction

The concept of Library is changing day by day and to cope up with these changes, LIS Professionals are expected to provide right information, to right users including differently able, at right time, in right amount and in right professional way. Libraries are service organizations which give services without discrimination to their numerous users, including disabled people. The main function of the Library is to collect, organize and disseminate information to one and all in a non-discriminating manner including to those with disabilities or differently able users. The disability is defined as physical or mental conditions the person that limits his/her ability to function, to move and to act. The high-level commitment is required on part of libraries to ensure access to full range of their services and facilities to their user community irrespective of their differential abilities. A crucial requirement for libraries is that the information they preserve and deliver in many formats must be made available to all including disabled users. These users need specialized attention and specialized services to fulfill their informational and educational needs by using assistive technologies and services.

Access to information is major problem for the disables in India. However, today ICT has helped to reduce the digital divide between sighted and the blinds by providing information onto their desktop.

ICT and its tools are highly flexible and provide great scope for usage by persons with one of other kind of disabilities.

2. Services for Differently Able Users

All library materials should ideally be accessible for all persons with disabilities. There are various ways to achieve this goal. Libraries should acquire talking books, talking newspaper, talking periodicals, video/DVD books with subtitles and/or sign language, Braille books, large print books, accessible e-books, easy-to-read books, tactile picture books or other non-print materials to improve and facilitate access to alternative-format library materials for persons with disabilities. Collections of alternative-format library materials for readers with disabilities explore ways to create and improve library services and resources for people with print disabilities and facilitate information exchange, resource-sharing among libraries. Making the library accessible for persons with disabilities includes the provision of services and programs that meet the needs of these user groups. Library may offer various services to the differently able persons and encourage them to make effective use of library services. The following services are given to the users with disabilities:

2.1 General Services

- **Home delivery service** to persons who are not able to come to the library
- **Outreach services** to persons in institutions and care facilities
- **Reading service** for patrons with reading difficulties (e.g., short texts, letters, instructions, articles on tape or CD) or scanning texts to make them accessible on a computer with screen reader
- Regularly scheduled consultations for persons with reading disabilities
- **Retrieving information** service is offered to the visually impaired or individuals who are having difficulty reaching materials on higher shelves.
- Wheelchair-accessible **photocopy services** are available at libraries. Library staffs also can photocopy materials for users with disabilities upon request.
- **Circulation service** includes extended loan periods of regular and reserve materials, allowing non circulating materials to be checked out, reducing or dismissing fines and willingness to accept special requests via the Internet, mail or phone.
- **Instruction-** Library guides could also be provided in various formats assist the visually impaired, to use the library catalog and online journal article indexes.
- **Proxy service** available for people with disabilities. Most often a designated proxy is allowed to check out or pick up library materials after submitting the proper forms.

2.2 ICT Based Services:

Information and communication technology can contribute to universal access to education, equity in education, the delivery of quality learning and teaching, teachers' professional development and more efficient education management, governance and administration. There are tools that enable easier access to technology such as computers or cell phones; newer technology or devices are designed to cater to their specific needs; and applications can be accessed through smart devices such as cell phones and tablets. Presented below are some innovations that have really helped those with physical disabilities.

2.2.1 Devices and software

2.2.1.1 For visually impaired

a) JAWS and Shruti--JAWS (Job Access With Speech) is one of the most popular and effective software's developed for the blind or visually impaired. The software enables visually challenged readers to read a computer screen with the help of a text-to-speech output or a refreshable Braille display.

Similar to Jaws is the 'Shruti' system which works in almost the same way as Jaws, but is much cheaper to access.

b) Sparsha--Sparsha is a toolset for the blind. Sparsha can translate the text on screen to BharatiBraille – a unified Braille script used to write English languages using cells containing six Braille dots. Apart from English, the languages supported by Sparsha include Hindi, Bengali, Assamese, Marathi, Gujarati, Oriya, Telugu and Kannada.

2.2.1.2 For speech impaired

Sanyog--Since its inception in 2001, Sanyog - a project of the Indian institute of technology, Kharagpur - has impacted the lives of several speech impaired children, and enabled them to express themselves in creative ways. It is an alternative and augmented communication tool that enables students with high motor disability to represent their thoughts through icons and images. It then takes these images to form syntactically and semantically correct sentences in English, as well as in Indian languages such as Bengali and Hindi.

2.0.2 Applications

2.2.2.1 For the visually impaired

Some interesting applications for the visually impaired are available in the market such as **Ariadne GPS**. This app uses GPS to track the position of the blind, and helps them navigate using talking maps. It vibrates the device when crossing a street, and can also announce bus and train stops. This application can be used on any device enabled with Google maps, and has made commuting fairly easy for the blind.

Other apps for the blind that can be used to procure information are colour id and vizwiz. **Color id** helps the visually impaired recognize the colours of the things around them. All they have to do is click a picture of the object and the app recognizes its colour and says it aloud. Similarly, any product information can be gathered from **vizwiz** by clicking and submitting its pictures. The picture can be sent to a web worker, an online repository or to a contact through email or twitter. A question must be asked with the image by recording the question, and a verbal response is received.

2.2.2.2 For the hearing impaired

Many times, the hearing impaired is in danger as they are not able to hear the alarms and alerts set off by danger. To address this, **tap tap** is an app that will vibrate and flash light from the device if there is any noise in the vicinity. For example, if there is knocking, if someone is shouting or if smoke alarm goes off, tap tap will send an alert to its user so that the person with hearing impairment can be alerted.

2.2.2.3 For the speech impaired

Communication is very frustrating for someone with speech impairments because it is so hard for them to

express themselves. **Proloquo2go** is an application that uses pictures in place of words. Students choose pictures that symbolize different nouns, verbs or phrases and the application would form a sentence and read it aloud.

Taptotalk is another application that uses the same principle of image-to-voice to help children with speech disabilities talk. A feature of Taptotalk is also its ability to store photographs and pictures from other sources, making the images used for communication more relevant and specific.

3. Role of Library Professionals

The Persons with Disabilities Act 1995, emphasizes that differently able persons should have access to education and library service at all levels and it is responsibility of LIS professionals to enable them to access both physical libraries as well as digital libraries. Therefore, LIS professionals play a vital role for making libraries inclusive which is very important for the growth of differently able as well as our society and our nation. To do this, there should be inclusive libraries at school level, college level, university level, public or private level. Moreover, at all level libraries should be managed by highly qualified LIS professionals. Thereby, through the libraries we can make a large impact on the education of persons with disabilities. By making libraries accessible and inclusive, we will not only address the needs of the differently able such as low vision or blind people, people faced with hearing challenges and physical challenges, but can also address the needs of people with cognitive disabilities. Institutions of higher education must provide students with disabilities with “auxiliary aids”. In that case, libraries and some of their significant and basic materials must be made accessible to students with disabilities. The library’s basic index of holdings (Whether formatted online or on index cards) must be accessible. Libraries continue to look for funding to improve access to their buildings. The rapid and pervasive integration of new technology in our lives and libraries in particular has generated increased interest in their potential role in helping disabled users make effective use of the library. The LIS professional can make out, what type of assistance the person with disabilities might need in order to access information resources in the library. The Librarian serves as a liaison between the libraries, patrons with disabilities, and campus offices for assistive services and technology. He may lead efforts to discuss library services, facilities, and assistive technology with differently able individuals as well as the campus community as a whole.

4. Recommendations for Library Professionals

The uneven availability of new information technology among the disabled compared to non-disabled users has highlighted a digital divide that separates users who are able to access electronic resources from those who have no opportunity to do so. To reduce the existing educational gap between the disabled and non-disabled users, some recommendations are made:

- a) The library authority and the university management should ensure that the benefits of the new technology should not bypass disabled students.
- b) The existing library facilities should be redesigned and modified with new technologies so as to enable mobility- challenged users to effectively and efficiently use library resources.
- c) Library staff and librarians should be oriented to ensure that no one is discriminated against in terms of provision of access to all library resources.
- d) The library management should endeavor to bridge the gap between the information needs of non-disabled users and disabled users.

- e) Many library buildings require alteration to reduce or eliminate barriers at entrances, should introduce ramp for individuals using wheel chairs, crutches, canes, elevators and handicapped restroom facilities. Specialized software and hardware should be obtained to increase access for visually impaired, physically challenged, hearing impaired, and those with learning disabilities.
- f) Libraries should regularly organize orientation programs for the visually challenged. Library staffs who interact with the visually challenged students should be sensitized toward their needs. The staff should also be trained in the uses of assistive technologies and information centers should cater to the needs of all kinds of its Clientele.

5. Conclusion

To implement second law of library science, the library supposed to meet satisfactorily the information need of differently able users by collecting and interpreting information, understanding the needs of users, and matching the needs with its resources. The library should develop its collection keeping in mind the present and future requirements of such users. The library collection should be a mix of the books/journals and other materials required by disabled as well non-disabled users. Library professionals need to take necessary steps to mobilize and upgrade the existing library and information systems and services to ensure a barrier free environment for differently able users. Use of Information Technology and personalized services is imperative and can prove beneficial both for libraries and users with disabilities.

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Green Movement vs. Green Library: An Approach towards Designing Library by Green Architecture

Dr. Swapan Khan

Librarian (Evening Shift), Narasinha Dutt College, Howrah, West Bengal, India
Email: khanswapan@gmail.com

Pronobi Porel

Librarian, Rabindra Mahavidyalaya, Champadanga, Hooghly, West Bengal, India
E-mail: khanpronobi@gmail.com

***Abstract:** The rise of 'Green Movement' ensures that all the people in this planet agree with the sustainability issue of the planet. A simple green step by all institutions and people brings the positive change of the health of the planet. The present paper describes the "Green Library" in the light of green architecture developed the Leadership in Energy and Environmental Design (LEED) rating system in the year 2000 and explores anticipated areas to greening the library activities. It also describes the steps to convert a conventional library into a "Green Library".*

***Keywords:** Green Library, Green Library Movement, Library Architecture, LEED, Green Activity, Green Building, Green Architecture*

1. Introduction

The root of the conservation movement is in Europe but the credit for the world's leader in environmentalism goes to the United States. The great visionaries Ralph Waldo Emerson and Henry David Thoreau proposed that "in wildness is the preservation of the world" (Lallanilla, 2016). The transcendentalism of the early 1800s and its carnival of the natural world arrived just in time to be crushed underfoot by the negative effects of the Industrial Revolution by unfettered use of coal in homes and factories which resulted in horrific air pollution in cities like London, Philadelphia, and Paris. Organized and general efforts on behalf of the environment only began in the late 19th century by starting with the formation of the Commons Preservation Society in 1865 (Lallanilla, 2016).

1.1 The Green Movement

A global movement was born in 1993 by founded the first "United Nations of the Green Building Councils" (USGBC) which was formed by Rick Fedrizzi, David Gottfried and Mike Italiano with a mission to promote sustainability-focused practices in the building and construction industry, and for the first time, brought together the industry across the value chain to advance green building (Antonelli, 2008). In the 20th century, the conservation movement was outshined by the Great Depression and World Wars. Only after World War II ended - and the rapid transformation of North America from an agricultural society to

an industrial one was well underway - did the modern environmental movement begin. Inspired by the protests and “teach-ins” that were occurring worldwide throughout the 1960s, Senator Gaylord Nelson proposed in 1969 for Earth Day by supporting nationwide grassroots demonstration on behalf of the environment (Lallanilla, 2016). Now at present, the green movement has been strengthened and annealed by the forces that oppose it. Today, the green movement is again defined and galvanized by its command of issues like global warming and climate change, wetlands preservation, the Keystone pipeline, nuclear proliferation, fisheries depletion, species extinction and other important environmental concerns.

2. Objectives of the study

The main objectives of the present study are as follows:

- i) To know about the green movement in the light of environmental protection;
- ii) To understand about green library;
- iii) To state the architectural aspects of green buildings for library;
- iv) To develop some steps for switching over to a green library;
- v) To uncover the potential areas for ‘green library’;
- vi) To know the standards for green library and so on.

3. The Green Movement vs. Green Library

A green library is designed to minimize negative impact on the natural environment and maximize indoor environmental quality by means of careful site selection, use of natural construction materials and biodegradable products, conservation of resources (Genovese & Albanese, 2011). The concept of ‘Green Library’ being in the domain of the Green Movement is comprises (Greene, 2007):

- Using natural energy more efficiently;
- Generating less waste in the library;
- Conserving natural water;
- Using and purchasing green products;
- Incorporating green features into the design of new buildings;

Mainly, a green library approaches to library buildings and services considers all aspects of the library ecosystem i.e. the building, the services, the systems that support the physical building and operations, as well as the supplies and services offered or used by the library. Green approaches are based in broad awareness of the short and long term impact on the physical and informational resources and services of the community.

4. Green Architecture

It known as “sustainable architecture” or “green building” is an approach to architectural design which emphasizes the place of the buildings with both local ecosystems & global environment. It aims to create environmental friendly and energy efficient buildings (Khurana, 2010). It entails actively harnessing renewable natural resources like solar energy and utilizing materials that cause the least possible damage to the global commons – water, soil, forests & air. The United States Green Building Council (USGBC) has been developed the Leadership in Energy and Environmental Design (LEED) rating system in the year 2000 (Antonelli, 2008). In India, the Indian Green Building Council has developed the standards

for Indian new or existing buildings (IGBC, n.d.).

5.1 Why Green Library?

In the light of green movement, the library professionals must suppose to the followings (Vijayan & Varadarajan, n.d.):

- the importance of being a good environmental steward;
- environmental sustainability in library spaces, library management, and library service;
- the facility to green its operation

5.2 Green Building Standards

There are several standards followed for developing Green Building in the world. One of the most important standards has been developed by the LEED– Leadership in Energy and Environmental Design which is administered by the U. S. Green Building Council and the others are Green Globes and Energy Star. The main goal of the Green Building Design focuses on the followings:

- Use renewable energy resources, such as solar and wind;
- Conserve non-renewable energy and scarce resources;
- Reduce human exposure to hazardous materials;
- Support access to alternative transportation like mass transit and bicycles.

5.3 LEED Building Rating System:

According to this standard, a total of 100 base points are used to assess a building as green. These base points are classified into different categories for different achieved level of points which is called ‘Certified Level’. In 2009, the LEED has maintained certified level as follows:

Sl.No.	Certified Level Name	Basis Point
1	Certified	40-49 points
2	Silver	50-59 points
3	Gold	60-79 points
4	Platinum	80 points and above

5.4 Credit Categories

A total of 100 basis points are categorized by different credit areas. These are as follows:

- ✓ Sustainable Sites - 22%
- ✓ Water Efficiency - 8%
- ✓ Energy & Atmosphere - 27%
- ✓ Materials & Resources - 20%
- ✓ Indoor Environmental Quality – 23%

The details of individual credit items are described in the table given below:

Sustainable Sites	Water Efficiency
<ul style="list-style-type: none"> • Near densely populated area • Alternative transportation • Reduce site disturbance • Near other service related buildings • Landscape and exterior • Light pollution reduction 	<ul style="list-style-type: none"> • Water efficient landscaping • Innovative wastewater technologies • Water use reduction • Waterless urinals • use low flow fixtures
Energy & Atmosphere	Materials & Resources
<ul style="list-style-type: none"> • Building Systems Commissioning • Minimum Energy Performance • CFC Reduction in HVAC Equipment • Renewable Energy • Measurement and Verification • Green Power 	<ul style="list-style-type: none"> • Collection of Recyclables • Building Reuse • Construction Waste Management • Resource Reuse • Rapidly Renewable Materials • Certified Wood
Indoor Environmental Quality	
<ul style="list-style-type: none"> • Minimum indoor air quality • Tobacco smoke control • Carbon dioxide monitoring • Increase ventilation effectiveness • Low-emitting materials 	<ul style="list-style-type: none"> • Indoor chemical pollutant source control • Controllability of systems • Thermal comfort • Daylight and views

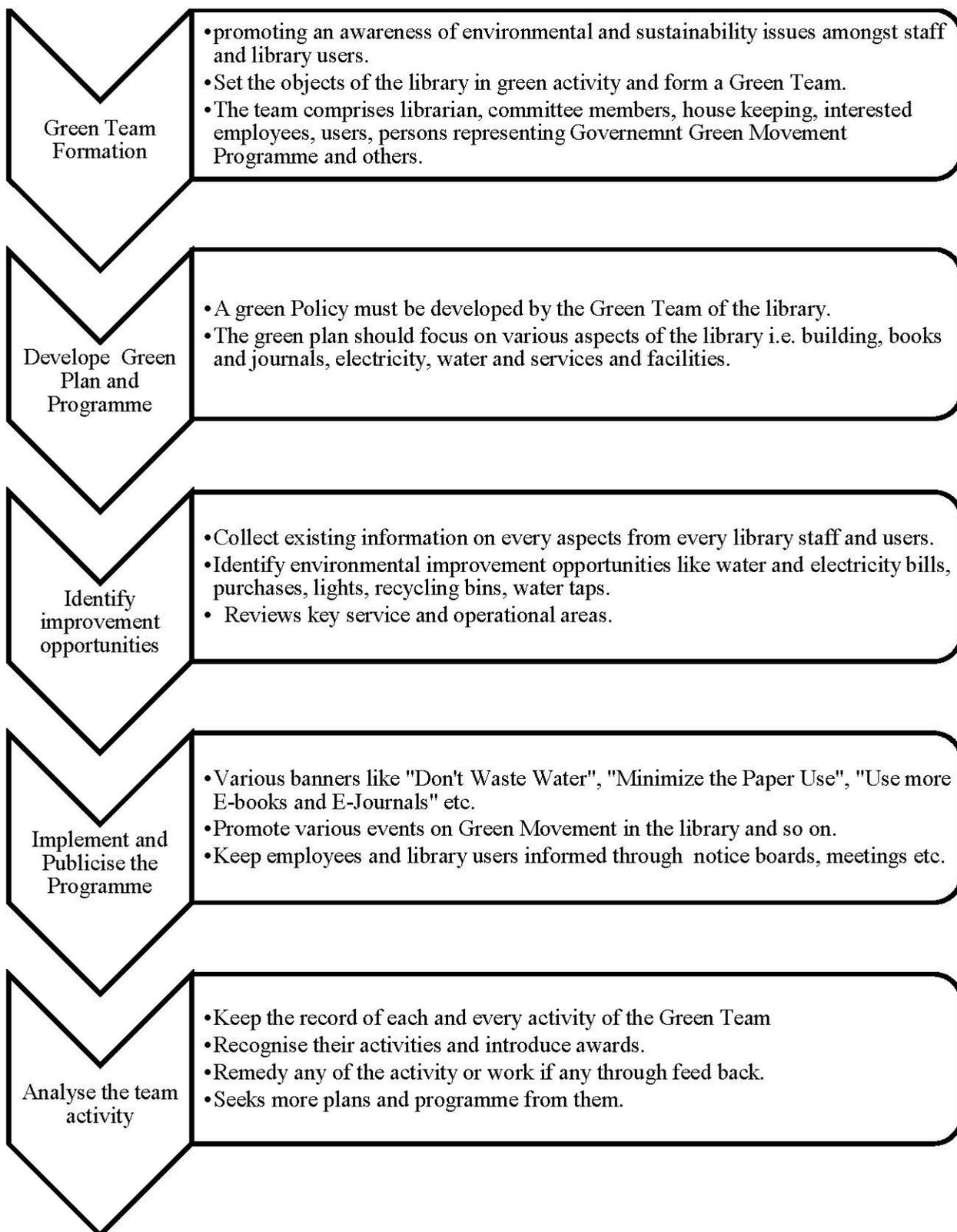
6.Characteristics of green or sustainable library

A green library or sustainable library must execute the following issues:

- Efficient management of -
 - energy and water resources,
 - material resources and waste,
- Restoration and protection of -
 - environmental quality,
 - health and indoor environmental quality,
- Reinforcement of natural systems;
- Integration of the design decision-making process.

7.Stepsto switch over to a ‘Green Library’

The following steps help library professionals to convert an existing library as “Green Library’ through basic guidelines(Greene, 2007).



8.Potential areas for Greening a Library

There are many potential areas to make a library as “Green Library” i.e. the sustainable site selection and development, provision of water conservation, energy conservation and energy efficiency, choice of building materials, innovative design and waste reduction, indoor environmental quality maintain, library products and services etc. The following discussions guide the library professionals to implement a ‘Green Plan’ (Greene, 2007).

8.1 Building and furniture

- ✓ Scientific internal layout for more use of natural light and air.
- ✓ Purchase environmental friendly furniture and fixture.
- ✓ Optimum use of windows, doors, corridors and bays.
- ✓ Gardening around the building and arrange for indoor plantation.
- ✓ Regular maintenance of building and furniture.

8.2 Power and water consumption

- ✓ Increase the use of solar power.
- ✓ Purchase energy saving electronic and electric goods.
- ✓ Provision of storage of rain water.
- ✓ Replace or repair old and damaged electronic appliances and water taps, cisterns etc.
- ✓ Regular maintenance (cleaning of drain, wash basin, toilet).

8.3 Control of paper consumption

- ✓ Both side printing and photocopy to save papers and print in draft mode when possible.
- ✓ Reuse envelopes and file folders.
- ✓ Make book stickers, scratch pads etc. from used papers.
- ✓ Write in single space on hard copies, use soft copies for proof reading, spell check before printing.
- ✓ Stop and control unwanted letters, unsubscribed magazines, booklet, and handbills etc.
- ✓ Centralize purchasing and use central files for hard copies, promote minimum layer of packaging for library products.
- ✓ Minimum information in printed notice, programme chart, seminar or conference documents and instruct to follow websites for detailed information.

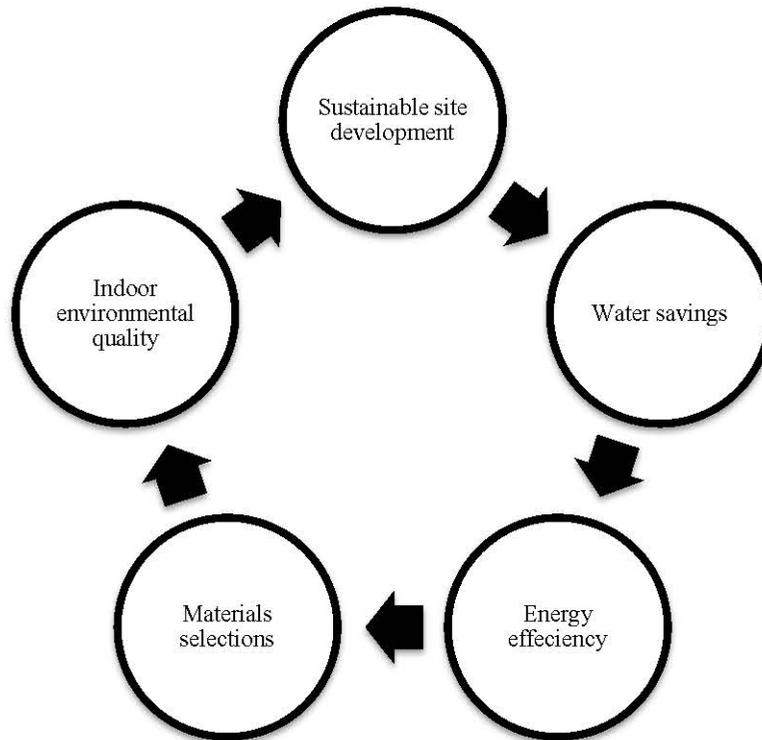
8.4 Promote to use electronic media

- ✓ Procure more e-books and e-journals is possible.
- ✓ Inspire users to use more electronic documents, voice or e-mail etc and guide to follow websites for library instruction, notices, current arrivals etc.
- ✓ Electronically issue return of books, reduce card catalogue and more use of OPAC.
- ✓ Share electronic files rather than hard copies,
- ✓ Find book lists from the websites of the publishers, Increase computerized CAS services.

9. Initiatives in India

A green building is judged whether it is green buildings or not on the basis of predefined rating systems. Now three primary Rating systems are applied for green building in India (Shailesh, n.d.). These are as follows:

9.1 Green Rating for Integrated Habitat Assessment (GRIHA): GRIHA is India's own rating system jointly developed by TERI and the Ministry of New and Renewable Energy, Government of India. It is a green building design evaluation system where buildings are rated in a three-tier process.



LEED-India approach for Green Buildings

9.2 Indian Green Building Council (IGBC): Confederation of Indian Industry (CII) formed the Indian Green Building Council (IGBC) in year 2001. It facilitates Indian green structures by developing green building rating systems (IGBC, n.d.).

9.3 Bureau of Energy Efficiency (BEE): BEE developed its own rating system for the buildings based on a 1 to 5 star scale. More stars mean more energy efficiency. BEE has developed the Energy Performance Index (EPI).

Moreover, the International Finance Corporation (IFC), the member of the World Bank Group, and the Confederation of Real Estate Developers' Associations of India (CREDAI) jointly developed EDGE (Excellence in Design for Greater Efficiencies) certification to promote green buildings in India.

10. Conclusion

Why are libraries becoming green after the appearance of green movement around the world? It is fact that the, libraries have been increasing the scope of their mission statements, to include working

for the enhancement of mankind by restoring the planet. Moreover, green library offers a degree of independence, because day-to-day operational cost goes down and it increases the image of the library to the community. “The time is right for librarians to step up and help communities become green and sustainable” (Antonelli, 2008). Therefore, the entire library professionals and stakeholders on behalf of the libraries or institutions require acting as role models by greening their steps.

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Libraries in an Attention Economy: A Bird's Eye View

Avik Roy

Librarian, Derozio Memorial College, Kolkata 700136
Email: avikroy.dmc@gmail.com

TanushreeRakshit

Librarian, Uluberia College, Howrah
Email: tanushreer24@gmail.com

***Abstract:** The study focuses on attention considered as currency in the new-age information economy. A Web survey using Google Forms has been conducted and the 170 responses collected have been analysed phenomenologically to understand the pattern of people's paying attention to different topics. Contextually, recommendations have been proposed towards better attention management by library professionals in the present information age.*

***Keywords:** Attention; Attention management; Attention economy; Attention mongers; Information; Knowledge management*

1. Introduction

Living in an age of information, people, presently, are replete with, overwhelmed and confused by the abundance or nuisance of information which is the most important resource in an information economy that eventually brings “reflexive modernisation” (Savolainen, 2008, p.1). Now, what is the reason that makes people baffled to such extent so far as their accessing of information is concerned? One possible answer to this is the inability of human beings in paying attention to the diversified contents being generated so rapidly in bytes simultaneously. The revolution of information and communication technology along with cheap rate of bandwidth from the Internet Service Providers (ISP) makes it possible to create and disseminate innumerable amount of data being generated every second in this twenty-first century. It's the nature of every human being on earth to constantly make endeavour to fathom their surroundings either with the available information or with accessing information to be competent enough to accomplish the activity. Therefore, the most important aspect of the present information age is not it's resource, that is, information but the ‘attention’ towards particular information to perform specific tasks at hand and management of attention on which the whole economy of the present age depends is another challenging as well as robust task. Now it's the call of the day that a shift of paradigm has become mandatory and the so called ‘players’ of information should concentrate more on ‘attention’ which is regarded as ‘currency’ than ‘information’ itself (Lanham, 2006) in this age of “attention mongers” (Sundar, 2018).

2. Literature review

2.1 Knowledge of the game

Herbert Simon, a Nobel-Prize winning economist puts it, “...a wealth of information creates a poverty of attention” (as cited in Davenport & Beck, 2001, p.11) and in terms of business-economics attention is regarded as “slippery tangible assets”. Like in every other economy in attention economy too, those who possess greater attention are wealthier and richer than their other counterparts. In order to make information reach its target people, now the ‘players’ of the information markets are constantly endeavouring to grasp the attention of the consumers through each and every means viz. Web pages, Social Networking Sites (SNS), e-commerce platforms, emails and many more. Since attention is currency now and represents the “measure for the use-value of information” (Gander, 2007, p.290), it’s simply not enough to possess information only but to make money out of information through the means of attention of its consumers. Precise but vividly, attention is “focused mental engagement on a particular item of information” (Davenport & Beck, 2001, p.20). However, Gander (2007) thinks that attention is a social phenomenon which he has studied phenomenologically. Even, he has gone to one step further by proclaiming that attention is symbolic capital like other capitals such as economic, social, cultural as expounded by Pierre Bourdieu. According to him, in order to increase the attractiveness of information it is not enough to have only novelty of information but it should be different in some aspects that is not monotonous in nature which Niklas Luhmann terms as “attention-catcher” and Siegfried Schmidt rightly calls it as “raw material of modern society”.

2.2 Attention mapping

Social scientists including Davenport and Beck (2001) are of the opinion that there is a phase in human beings called “awareness” or in simple terms “pre-attentive processes” (Gander, 2007, p.291) in which a filtration happens in the mind of the seekers regarding the available information. Ergo, it won’t be an exaggeration if one says that marketing of attention is an eventual process towards making this currency into money or other tangible goods. Awareness is a general approach towards information in vogue while attention which is the filtered one is targeted and specific in nature.

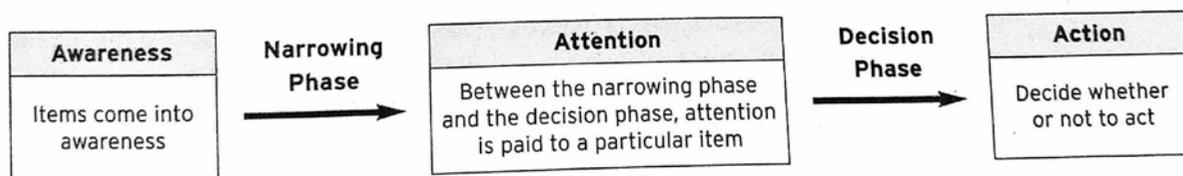


Figure 1 A Graphic Model of Attention Processes. Adopted from “The Attention Economy: Understanding the new currency of business” by Thomas H. Davenport and John C. Beck, Harvard Business School Press, p. 22. Copyright 2001 by Accenture.

As shown in Figure 1, gaining access to the required information, at the very first awareness happens in the mind of the onlookers where the seekers become aware of the available information; then having gone through a narrowing phase similar to what we call filtration, the person pays attention to the particular item required and at the very last it is decided whether the information is to be utilised or not. Evidently, it’s not enough only to have information at hand but attention too in making the available information gets to work. In an information economy (age), strategy and techniques as well as tools should be fruitfully developed in such a manner that the processing of information could be done with expending

only an iota of attention which has a scarcity in human beings due to biological and physiological factors.

2.3 Types of attention

In their seminal work, Davenport and Beck (2001) have proposed different types of attention in paired opposite groups such as 1) captive and voluntary, 2) aversive and attractive and 3) front-of-mind and back-of-mind. The captive and voluntary are based on choice in which an innate selection mechanism happens inside the seekers' mind regarding which and what type of information he is looking for since people's paying attention to specific items is not programmed towards the fulfilment of compulsion always and at times it depends on wish-fulfilment too. The second type, that is, the aversive attention takes place when people want to avoid negative experiences while through attractive attention they inculcate the positive ones. However, while front-of-mind attention is conscious, focused and explicit, the back-of-mind attention may simultaneously happen along with the former one. While processing nascent information people generally use their front-of-mind attention though there seems to be so many inherent other aspects that require back-of-mind attention to process the same.

3. Methodology

In order to know the topics on which people generally pay attention to while browsing social networking sites such as Facebook, Whatsapp, YouTube, LinkedIn etc., an open web survey has been conducted during September to December, 2019 and 170 responses have been collected through the Google Forms prepared for the survey mentioned above. The form has been constructed with both closed and open questions particularly focussing on people's practice of information seeking and sharing through social networking sites (SNS). The data thus collected have been analysed and interpreted using phenomenological techniques popular to social scientists. A significant number of people of both the genders-males (60.6%) and females (39.4%) have participated in the survey. It has been observed that there are different strata of data with different academic qualifications amongst the participants.

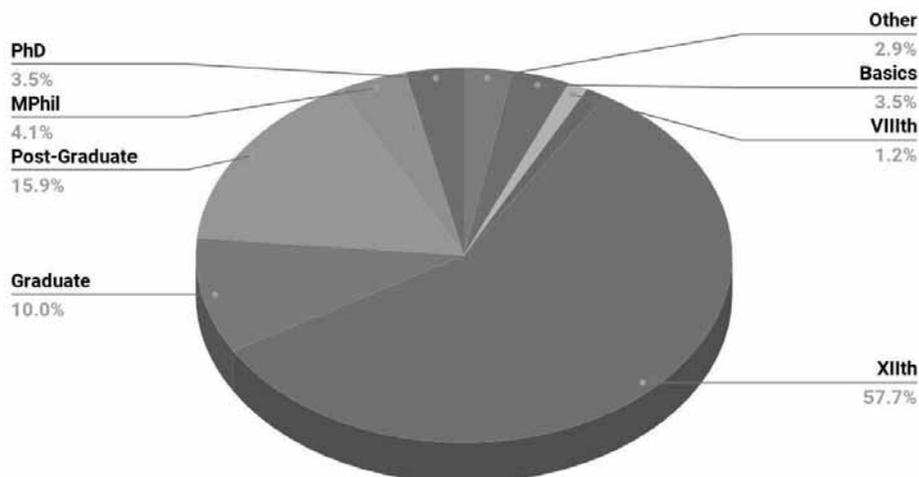


Figure 2 Academic qualifications of the participants

Since the attention periphery of individuals is not linear in nature, both the academic and the technical and other types of qualifications have been considered with utmost importance.

4. Analysis and discussion

4.1 Serendipity in seeking and sharing information

The participants have expressed that they browse, search or share those pieces of information on SNS that give them pleasure and during this, the sudden discover of information actually makes them happy and thrilled. Since attention is not a pre-programmed phenomenon, they pay their attention on those things that excite them and this notion conforms to the findings of research of Savolainen (2008).

4.2 Nascent occurring in society

A significant number of participants have reported that they pay attention to those happenings which occurred in the recent past. This implies that attention of people flows with the occurrences of the society and undoubtedly, this creates a kind of ripple of images in their mind which in turn makes them seek the same type of information frequently.

4.3 Periphery of individuals

The study aptly shows that each and every individual create certain periphery in his mind in which he places different informational objects according to their preferences in everyday life. Similarly, the working professionals are more attentive to their profession related information; the business persons to their business and other financial matters. A significant observation has been noticed that no person willingly or unwillingly wants to extend this periphery in order to accommodate other types of information.

5. Recommendations and conclusion

Keeping in mind the nature of paying attention to the informational stuff, the following recommendations are noteworthy in the context of library and information centres (LIC):

- i. A library should be so designed that the user finds pleasure in exploring different corners of it;
- ii. Since libraries deal with information in printed and non-printed forms, the information should be properly marketed in such a way that may attract the attention of the onlookers;
- iii. The professionals of LIC should be more careful in catering the information to the users keeping in mind the notion that it's not only novelty but the presentation matters much in attracting the attention of the users;
- iv. The arrangement of books on shelves should be in such a way that should surprise its users and the serendipity works perfectly for them. A librarian may execute this by placing the most preferred books at a position inside the library that can be visible first;
- v. Email notifications should be sent to the users but not to that much extent that may disturb them;
- vi. LIC may use SNS to deal with the queries and other assistance related to the information;
- vii. People pay more attention on those subjects that either directly relate to him or have at least some inkling with him. Ergo, customized information services may be provided to them instead of general ones. One possible way of accomplishing this may be sending emails to the users with their names on it.
- viii. LIC should cater that information that may cover local news. However, the nature of information should be judged after carefully studying the requirement of the users. This may create attractive attention regarding information in their mind.

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Green Library and Initiative of Vidyanagar College Library, South 24 Parganas, WB: A Brief Study

Rumpa Pal
Librarian, Vidyanagar College, South 24 Parganas, Affiliated to University of Calcutta
e-mail Id: pal.rumpa@gmail.com

***Abstract:** Green library or green building was the popular concept in India and should be reintroduced. This paper discusses about the Green Library. General method, technique, element and need for green library are highlights briefly here. Some descriptions about national and international green libraries are discusses here. This study covers only on the present scenario of Vidyanagar College Library. It is discussed about green thinking, initiatives and activities of Vidyanagar College Library, South 24 Parganas in this paper. Some suggestions are given here for future upliftment to going green.*

***Keywords:** Green Library; Green Library Elements; Green Library Standards; Green Library Initiatives; Vidyanagar College Library.*

1. Introduction

Library is a social institution. Libraries have some role towards the society. Library should take necessary action to protect the environment. Green Library is the one easy technique which can help to conservation of natural energy by maximum use of renewable natural material and minimum misuse of energy. Society and environment will be benefited with Green Library. A healthy natural environment is needed for hour survival and quality of life. So it's high time for librarians to play a major role for the betterment of environment. Many librarians and other information professionals are taking action to ensure that their workplaces will be environmentally friendly. Green libraries are a part of the larger green building movement. Also known as sustainable libraries, green libraries are being built all over the world.

2. Objectives of the Study

The objectives of the study are as follows:

- To understand the meaning and importance of green libraries.
- To discuss about how libraries can be transformed into Green Libraries.
- To explain various techniques and methods for greening the library.

- To identify the standards necessary for green libraries in India.
- To identify on-going major green library initiatives at national and international levels.
- To study initiative of Vidyanagar College Library to going green.
- To make some suggestions for building green libraries for sustainable development.

3. Review of related Literature

Saha and Padhan (2019) described on green libraries effect to the academic institutions on US based libraries. The study covered up only on green initiatives of 19 numbers green libraries in US. Meher and Parabhoi (2017) studied on green library and special reference to Indian libraries. This paper discussed on role of green librarian Indian initiatives. Leena (2015) discussed on green libraries in academic institutions. This paper focussed on various aspects of green libraries and some international initiatives. Chakraborty (2013) studied on realities of the metropolis libraries. This paper focussed on library collections, green measures of some important libraries. This study covered only four university libraries (University of Calcutta Library, Mumbai University Library, Madras University Library and Delhi University Library).

By reviewing the published literature it is noted that most of the studies were conducted on overview of green library and initiatives and implementation in some public and university libraries. But no study has been so far undertaken on the college library. Hence, the present study is an attempt to find out the green thinking in Vidyanagar College Library, South 24 Parganas.

4. Methodology

4.1 Scope and Coverage

This study encompasses the Vidyanagar College Library of South 24 Parganas, located at Vidyanagar College, Vidyanagar, Charashyamdas, South 24 Parganas.

4.2 Methods Used

This paper deals with the green concept and activities which are carried out by Vidyanagar College Library. Information has been collected from various register and personal observation has been taken place where necessary.

5. Green Library

5.1 Concept of Green Library

According to the Online Dictionary for Library and Information Science (ODLIS), Green Libraries are “designed to minimize negative impact on the natural environment and maximize indoor environmental quality by means of careful site selection, use of natural construction materials and biodegradable products, conservation of resources (water, energy, paper) and responsible waste disposal (recycling, etc.)”

The three broad aspects can be chosen for greening like Green Building, Green Resources and Green Services. Green design is an integrated process and it is a foundation of green library. A green building cannot be made properly if it does not have proper integration in the planning phase, but it should be designed in such a way that many of the potential benefits of sustainable design are eliminated.

5.2 Objectives of Green Library

- To make use of those products which can be reusable

- To create an environmental awareness among people
- To proper use of technology to reduce library expenses
- To promote green library movement
- To contribute little efforts to make a green earth
- To save energy by making library compound greenery

5.3 Need for Green Libraries

All buildings use resources such as land, energy, water and materials to fulfill the functional needs of a space. As such, there can be no building without environmental impact. A building is green when it is resource efficient and fulfills the functional requirement of the space with minimum negative impact on the environment over the longest possible time.

5.3.1 Affordable Cost: Now cost of constructing green libraries has become affordable and it is possible to construct or renovate the existing building within the budget.

5.3.2 Commitment to Society: As library is community organization. It has the social responsibility to reduce the harmful impact to environment.

5.3.3 Conservation of energy: Most of energy resources are finite and it is our responsibility to use these resources with care for our generation and future generations.

5.3.4 Reduction of Carbon foot prints: Greening libraries reduce the carbon footprint of our library building. The term carbon foot print is defined as “the total amount of greenhouse gases produced to directly and indirectly support human activities, usually expressed in equivalent tons of carbon dioxide (CO₂).”

5.3.5 Economic Benefits: By way of using efficient lighting systems and recycling of waste material and reuse of water we will be able to get economic benefits.

5.3.6 Water Conservation: Reduce potable water use by considering alternative on-site water sources (for example rainwater, storm water and air conditioner condensate) for custodial uses and toilet flushing, planting native and adaptable vegetation reduces the need for irrigation.

6. Elements of Designing Green Library

LEED (Leadership in Energy and Environmental Design) judge buildings sustainability and certify them as Silver or Gold or Platinum depending on five major components:

6.1 Site Selection: Before building can start, a site must be chosen. The site location must be ecologically friendly. LEED has a number of guidelines to help the site selection process. It should be in a perfect locality such as away from the noise zone like club, entertainment hall, etc. Public transportation system to reach library is a necessary element.

6.2 Water Conservation: Water resources make the atmosphere cool of the library. For the good sanitation system a library should plan in proper water available area which helps library clean, green and healthy. There are many different ways for libraries to conserve water, to capture rainwater runoff to be used in irrigation and a strong water management system that incorporates native plants and grasses. As natural resources are decreasing by its amount, drinking water is also one of them so it's become responsibility of every human being to save drinking water. By looking in to the matter a library can

reuse of waste water and rainwater in plantation, harvesting and flushing in toilets.

6.3 Energy Efficiency: Energy efficiency is considered by many to be the most important category in becoming sustainable. In the LEED rating system it is the heaviest weighted of all the categories.

A library should have sufficient windows, glass windows and skylights which allow natural light abruptly in to it and there would be no need of any light generated from electricity during day time. Also using of low energy consuming bulbs and lights in non-reading areas during night time indirectly help library financially and save electricity as a whole.

Electricity can be generated using direct sunlight by planting solar system on the roof top of library building. Also the surplus energy can be conserved and helps during summer when library need extra energy consumption because of the use of air conditioner, fan and cooler.

6.4 Material and Resources: The primary responsibility in selecting materials for the library is to contribute as little waste as possible. Another responsibility is to choose materials that can be produced without causing too much damage to the natural environment. Green Library should be build up by using recyclable and environment sustained material.

6.5 Indoor Air Quality: Along with energy inefficiency, poor air quality has been another side-effect of the post air conditioning building design. Because most modern buildings are temperature controlled, they are designed to be airtight. The lack of ventilation can not only make buildings expensive to cool, it also traps harmful toxins that can do serious damage to people's respiratory systems. Trees gives pleasant air and it control air-conditioner operation during summer.

7. Strategies, Methods and Techniques for Libraries in “going Green”

7.1 Materials & Equipment

All the materials and equipment used in the library should be selected keeping in mind the green library practices such way that it reduces the overall consumption of energy and the following measures may be practiced to make the library green.

- Application of membership may be made through online mode. Required supporting documents may be collected in soft copy only.
- Card catalogue may be removed and OPAC (Online Public Access Catalogue) may be provided.
- Provide online services by making use of web 2.0 technologies.
- E-receipts may be given instead of paper receipts.
- Laptops which use less electricity than desktop versions may be used.
- Paper pens may be used by staff and users.
- All the electronic equipment used in the library may be according to the latest star rating for reducing the consumption of electricity and also reduces the electricity bill.
- Old electricity consuming equipment may be changed into new star rated products.
- Replacement outdated appliances.
- Light sensors may be used for lighting so that the areas will be lighted when in use by users.
- LED bulbs and tubes may be used for lightning. Use eco-friendly light bulbs which will save electricity.

- Solar panel may be placed on library building for creating solar energy and in turn for use in the library.
- Strategically placed windows will provide natural light and may help with heating and cooling cost.
- Indoor air quality may be increased by growing indoor plants.
- Specify salvaged or refurbished materials such as wood, flooring, paneling, cabinets, doors, frames, mantles, iron work, decorative light fixtures, bricks and masonry.
- Use geo-thermal heater and solar tubes that capture day light and deliver it inside to illuminate interior save energy.
- Natural pesticides/ products may be used for preservation of reading materials (Books, News Papers, etc.).
- Cleaning tools like brooms and mops should made up organic plant based materials.

7.2 Energy

To make efficient the library energy efficient we should approach in two ways, one is use of less energy for library consumption and on the other hand energizes the library with green energy generated by green technology.

Energy efficiency is considered to be the major category in becoming the library green. Energy can be produced by solar, hydro and wind sources. Using efficient renewable energy system can gain cost effectiveness, reduce greenhouse emissions and also decreases the dependency on conventional energy resources. Libraries can save a lot of energy by following the measures stated below:

- Energy saving light, air conditioning, heating and other electrical appliances need to be installed to reduce cost.
- Use maximum day light for daily activities.
- Glass technology is gained popular and can be used in different parts of library building so that natural light is maximum utilized there by saving energy.
- Turning off fan, light and other electric appliances when not in use.
- Automate power down.
- Maximum use of renewable energy like solar energy, wind energy and geo- thermal energy etc.
- Use of larger window and ventilating system.
- Reduce heat islands by eliminating or shading blacktop paving and dark roof surfaces.
- Motion and light sensors, timers and energy saving dimmers can be used which helps in reducing energy consumed.
- Renovating existing library building according to LEED certification under the LEED for Existing Building (LEED-EB) option.
- Train library users and staff in the effective use of energy.

7.3 Waste Management

Waste management plays an important role in making libraries sustainable. Repair, recycle and reuse are the three principles to be followed in making the libraries green. Proper maintenance of the waste by cooperating with other departments of the parent institutions make the library equips to follow the green principles. The following measures may be practiced by the librarians in achieving the proper maintenance on the waste.

- Reuse and recycle water, paper etc.
- Recycle computers and buy recycled ink cartridges and other supplies.
- Old furniture may be send to other needed departments or recycled and used again.
- Discard weeded books by selling it to used book dealers, exchange library materials with other participating libraries or donate to other libraries.
- Get rid of waste by composting and stop using plastic bags.

8. Standards for Green Libraries

There are several standards and protocols by national and international organizations for green and sustainable building developments.

8.1 Leadership in Energy and Environmental Design (LEED-India)

Leadership in Energy and Environmental Design (LEED-India) is one of the most popular green building certification programmes used worldwide, developed by non-profit organization the United States Green Building Council (USGBC) in the year 2000.

There are four certification level (certified, silver, gold, platinum) awarded according to achievement as evaluated by points using the LEED score card.

8.2 Indian Green Building Council (IGBC)

Confederation of Indian Industry (CII) formed the Indian Green Building Council (IGBC) in year 2001 to promote and rate green building in India. IGBC is the non-profit research institutions. The council offers services include developing new green building rating programmers, certification services and green building training programmers

8.3 Green Rating for Integrated Habitat Assessment (GRIHA)

GRIHA is India's own rating system jointly developed by TERI and the Ministry of New and Renewable Energy, Government of India. GRIHA council is an independent platform for the interaction on scientific and administrative issues related to sustainable habitant in the Indian context.

8.4 BEE (Bureau of Energy Efficiency)

BEE developed its own rating system for buildings. BEE has developed the Energy Performance Index (EPI). It is an agency of the Government of India, under the Ministry of Power created in March 2002 under the provisions of the nation's 2001 Energy Conservation Act.

8.5 Chicago Illinois Standard

Chicago is one of the first cities of incorporate environmentally friendly practices into public buildings and developed its own standard. This standard is highly influenced by LEED.

8.6 Brown Green Standard

California governor Jerry Brown discussed the emerging trend of green libraries and proclaimed that the libraries were on thus cutting edge of green design.

8.7 BREEAM (Building Research Establishment Environmental Assessment Method)

BREEAM first published by the Building Research Establishment (BRE) in 1990 is the world's longest established method of assessing, rating, and certifying the sustainability of buildings.

8.8 CASBEE (Comprehensive Assessment for Building Environment Efficiency)

CASBEE is a tool emerged in Asian Region developed by Japan Sustainable Building Consortium (JSBC) in 2001.

8.9 Green Star

Green Star is developed by Green Building Council of Australia (GBCA) in 2003. It is Australia's most trusted rating system for the design construction of operation of sustainable development.

8.10 Green Mark

The BCA Green Mark Scheme was launched in January 2005 as an initiative to drive Singapore's construction in the system towards more environmental-friendly buildings.

8.11 GBI (Green Building Index)

GBI is Malaysia's industry recognized rating tool developed by Pertubuhan Arkitek Malaysia/ Malaysian Institute of Architects (PAM) and The Association of Consulting Engineers Malaysia (ACEM) in 2009.

9. Green Library Initiatives

9.1 Indian initiatives towards Greening India:

India has been ranked third on the list of top 10 countries in Leadership in Energy and Environmental Design outside America, according to the latest US Green Building Council report. Canada followed by China occupies the top two ranks in the ranking of the top 10 countries for Leadership in Energy and Environmental Design (LEED) outside the US. There are numbers of Green library has situated at different part of the country. In Asia's first LEED Gold rated Library building is Anna Central Library, Chennai. There are some other green libraries are given below:

9.1.1 Karnataka University Library, Dharwad:

The library stated working since 1950. The library is eco-friendly library. They facilitate. Give a green space to the students of the University. The library follows the traditional Gurukul system in this view they setup a green library environment. The main motto of the green library is to facilitate students for group discussion. The Library gives an open study space for the student with sitting, dirking and WiFi facilities, etc. The green library situated at nearest to all P.G departments so that students can get maximum benefits.

9.1.2 Mumbai University Library:

The Mumbai University Library was setup in the year 1880. The library are made with eco-friendly equipments with wood the size of the windows are wide so that proper light get in to the library. The library gives a big open space area for the readers. The library use wood as stack materials.

9.1.3 Madras University Library:

It was built in the year 1907 in Indo-British style. The library use wood material in stack areas and reference hall, periodical section reading hall. The windows are big and wide and proper lights come to the reading area and fresh air came.

9.1.4 Anna Centenary Library (ACL):

The library was established in 2010 by Government of Tamilnadu situated at Kotturpuram, Chennai. The buildings occupy an area of 8 acres. The library is well equipping with modern technology and proper use light, air and wood. The cost of the building is 172 crore. It is one of the reputed green libraries in India which is gold rating by LEED.

9.1.5 Calcutta University Library:

The great height, vast open areas, thick walls, windows all through the eastern wall are some green gestures that are in built in this heritage structure.

Other green libraries initiatives in India are:

- Delhi University Library, Delhi
- Perma Karpo Library, Ladakh in Indian Himalayas
- NIT, Library Silchar Assam, India
- NIT Trichy Library

9.2 International Level

In the 2000s (decade) a number of high-profile green libraries have been built in the U.S. and in the rest of the world.

- Seattle Public Library (Ballard Branch), USA (2004)
- National Library Singapore, Singapore (2005)
- Minneapolis Public Library (2006)
- California University (2005)
- Blair Library, USA
- Eden Prairie Library, USA
- The Little Sun Ecological Library, Mexico
- Spanish Peak Library, UK
- Helsinki Library, Germany
- Forshan Library, Chennai

10. Green Measures in Vidyanagar College Library:

10.1 Vidyanagar College Library

Vidyanagar College was established on 29th July 1963. It is affiliated with the University of Culcutta. The college is situated at Vidyanagar by the side of Nibaran Dutta Road near Diamond Harber Road - Amtala Bus stop.

It is a co-educational under-graduation college in South 24 Parganas, West Bengal, India. The College has received affiliation for Arts in 1963 and later in 1969 for Commerce and in 1983 for the Science stream.

Beside the 12 subjects (7 are in Honours Courses) in three streams (Arts, Science and Commerce) students are interested in sports, seminar, and workshop also.

Research papers/Articles and case Studies from practitioners, academicians, research scholars and students can present their papers in the national seminar in hard as well as soft copies. And those are published in the form of book having ISBN number.

And this college is maintaining a herbal garden also.

Vidyanagar College Library is consists of One Reading Room, One Stack Room and one Book Processing section. Library has a ramp at entrance for Differently-abled Persons.

Library building is situated at ground floor of Auditorium Building of the Institute. The total area of the library is 3100 sq. feet (Stack Room: 1750 Sq. Ft. + Reading Room: 1150 Sq. Ft. + Processing Room: 200 Sq. Ft.).

About 2,800 students can use more over 22,000 books. Some periodicals used to help to the academicians. The thirteen (13) nos. computers are used presently for library work. 6 nos. daily News Papers are available in the library for the use of interested students and staff.

This college library is now completely under service of 16 numbers Close Circuit cameras (night vision) with their monitors.

10.2 Library Collection:

Books:	22118+
News Papers:	06+
Magazine:	01+

E-resources: 6,000+ e-journals and 31,35,000+ e-books [subscribed from INFLIBNET N-LIST (<https://nlist.inflibnet.ac.in/>)

This college library has two institutional membership of Special Libraries like British Council Library of Kolkata (With Single User Online facility) and American Library of Kolkata.

10.3 Users:

Moreover 2800 students including arts, science and commerce stream can use library Reading Room material. Teaching & Non-teaching staff of this college also use the library.

10.4 Green Measures:

The main goal of green building is to develop and use sustainable energy - efficient resources in construction, maintenance and over all life of the structure.

The great height of the rooms and vast open areas help to the library building naturally cool. The library provides this open space for readers. Large windows, thick walls and wide corridor make the environment pleasant. Sunshades of the windows prevent the direct sunlight but allow natural lights. Bio-degradable and environment friendly wood is mostly use as material for library furniture (almirah, stack, Paper display desk, journal display board, reading room table, bench, chair, issue-return desk, computer table, book card drawer, etc.

Pot plants and indoor plants are in library premises. The library building have the ventilation system (skylight, etc.) for refreshing the library rooms. Outside of the library and open space of the college have green plants, herbal garden, fruit, vegetable, flower garden.

Fire extinguishers are present in library rooms.

11. Suggestions and Recommendations:

Following suggestions are required for green libraries:

- Libraries can use a variety of tools to popularize the ‘Green Concept’ and educate their users about the features of their green buildings. These include in-library displays, publications and library programs relevant on ‘going green’.
- Libraries can arrange more number of strategic thinking and planning sessions to ensure sustainability.
- Spread awareness and popularize and market the libraries green activities through various programs and also through social media or other methods regularly.
- Encourage organic roof top gardening which decreases the heating of library buildings as well as increases staff team building skills development and fostering staff morale.
- Encourage sustainable collection services such as e-books, e-journals which reduces paper consumption.
- Reuse and recycling concepts should be promoted and practiced.
- Digitization of rare documents can be done so save paper.
- Green concepts should promoted, become example in libraries attach to organization, universities and industries.
- Sustainability in library building, about green library activities should be included to LIS (Library and Information Science) curricula. So that new generation library professional with adapt this ideas.
- Government or management should consider the adaption of sustainable principles in their buildings. Services and practices in order to reduce the negative impact to the environment of the region it belongs.
- Government should take steps to promote green libraries through award and financial aid to maintain such libraries.
- Government/Universities should make all the efforts to transform Libraries into Green buildings/libraries, wherever it is possible.
- UGC should make it mandate for all colleges and universities to get the approval to go for green libraries and also green buildings.
- UGC should take steps to improve library buildings in academic institutions and convert them green libraries by providing grants.
- UGC should conduct conferences, seminars on green library concepts and also provide financial aid to institutions to conduct programs on green library practices. Organize environmental trainings, tips for best practices and interactions how to measure success and encouragement are

essential.

It is very essential to plan green libraries, which was popular concept in India. That treasure need to be explored and reintroduced in India.

12. Conclusion

A green library design is less expensive because of reduced upfront costs energy, water conservation and increased efficiency. Green Libraries are very important role in the environmental protection. In the present days library always facing problems like space and budget, in the same way the books has been facing problems from dust, moisture, fungus and it needs special care. The green library is a modern library where minimize electricity consumption and maximum use of renewable sources like air, sunlight, woods. It is much more needed for a library to greening the library movement. The librarians should take some decisions to make green library and also take part in green library movement. Librarians should act as role models for sustainability by providing suitable and relevant information related to green issues and concerns. Many national and international bodies are helping to make green library. Government should encourage the green library and guide to the all the libraries for making green libraries. Some of the Indian libraries have been trying to make a successful green library.

Librarians of the Vidyanagar College Library are trying to minimize the use artificial energy and start to digitization the library gradually like prepare soft copy of reading materials to save paper, etc. Library authority (college authority and library committee) should take separate initiative to going green.

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Importance of M-Learning in Spreading Academic Information in India: An Evaluative Study from LIS Perspective

Dr. Antara Chakraborty
Ph.D., Jadavpur University
Email: antara_bolpur47@rediffmail.com

***Abstract:** M-learning or Mobile learning is a kind of learning which is available through mobile technologies. Mobile is a portable device which can offer learning opportunities irrespective of the location of the learner and the time of learning. The present paper investigates the importance of M-learning in spreading library services in India. In the very beginning it provides the idea of transition from e-learning to m-learning; and then from m-learning to u-learning. Then it highlights some important advantages and disadvantages of m-learning. After that the paper focuses on popularity of M-learning in India and thereafter it enters into the yolk part by pointing out and explaining how M-learning is helping in spreading academic information through Facebook; Whatsapp; mail correspondence; personal calls and thus library services crosses the four wall of library and reach to its target audience at anywhere in anytime. Therefore the outcome of this study would be beneficial for the research scholars, and knowledge producers to realise the importance of M-learning in the field of extended library services and to decode its increasing role as an inseparable reality for the 21st century's mobile centric 'smart generations' of India.*

Keywords: M-learning; LIS Education; India

1. Introduction

M-learning or mobile learning is any kind of learning which can be achieved through using opportunities offered by mobile technologies. This type of learning occurs in a mobile environment or through a mobile device, like cellular phones, Personal Digital Assistants (PDA), smartphones, tablets PC etc. Therefore the creation of smartphone has provided the platform for mobile-learning, and thus a new era of teaching-learning process has been ushered. M-learning offers the mobility in the process of learning in the sense that it is accessible from virtually anywhere, and thus provides access to different learning materials available.

In the field of education, mobile learning has become an inevitable reality as students, research scholars, and LIS professionals keep themselves connected through different academic groups in Whatsapp, Telegram, Facebook and so on. Thus the 'need' has converted into a 'habit' gradually as most people cannot think his / her day without a smart phone. So the library services also have to be shaped accordingly.

2. Main Part

Utilization of m-learning has a significant positive effect on the effectiveness of learning. It can facilitate ease of learning, cultivate interest in learning, clarify learning, foster self-learning, and overcome learning difficulties. [5]

Mobile learning is a field which combines two important areas: mobile computing and e-learning. It is believed that ICTs can empower teachers and learners by facilitating communication and interaction, offering new modes of delivery, and generally transforming teaching and learning processes. Of the many different forms of ICTs, mobile phones are thought, for several reasons, to be a particularly suitable tool for advancing education in developing regions. If the so-called 'developed' nations of Asia are unable to properly implement e-learning projects, what hope is there for the lesser developed nations of Asia and the world?

While many developing nations find Internet based e-learning unsuitable for their needs, mobile learning methods – specifically those involving the use of cell-phones for both formal and informal learning – hold great promise for them. The technology is more affordable; learners are familiar with it; and with proper instructional design it promises educational opportunities with an increased flexibility for learners, satisfying the 'anytime/ anywhere' requirement. [1]

People of the whole world in general and India in particular witnessed the transition from traditional learning to e-learning and from e-learning to m-learning and finally into u-learning. Ubiquitous-learning here refers to have a seamless internet connection at anywhere and anytime.

An exclusive article entitled "*Chinta Chhodo, Chip Se Jiyo*" which was published in Amar Ujala newspaper on dated 29th march, 2012 on Hi-Tech page highlighted the SMARTUNIFORM experiment of a Brazillan school which is also based on u-computing. In this school, students wear the Smart Uniforms in which Sensors are fitted in such a manner that when students reaches the entry gate of their schools, electronic readers read their presence along with arrival time and informs their positions to their parents by SMS. [2]

2.1 The Advantages of using M-learning while rendering services to users are as follows:

1. It offers strong portability by replacing books and other traditional materials.
2. It heightens the possibilities of quick feedback and tips from others.
3. It offers possibilities for crosschecking information from multiple sources.
4. It can be accessible virtually from anywhere.
5. Mobile helps the students, researchers and professionals to stay connected with their target 'virtual community' at their hour of need and offers platform for sharing information on common interest.
6. It is cost effective, as the price of digital content on tablets is falling sharply compared to the traditional media (books, CD and DVD, etc.).
7. Amount of digitally stored object is much bigger comparing to the traditional ones.
8. Other than being connected through 'online', mobile technologies also include Bluetooth, Audios, Camera & Video, Calculator, Date & Time indicator, SMS, MMS etc. which has made it useful even in offline.

2.2 The Disadvantages of M-learning while rendering services to users are as follows:

1. Consultation through small screen can be tiring for eyes.
2. Mobile devices limit the type and amount of information being displayed in case of text presentation.

3. The user has to bear the one time expenditure of a smart phone and also the recurring expenditure of talk-time recharge and internet.
4. Requirement for frequent charging specially in case the hand set is aging is also a problem for the users.
5. In addition, the users' psychological perspective is also a factor, as some users prefer using mobile devices for leisure activity such as texting friends and accessing social network services than using them for serious academic work. [3]
6. Mental captivity is another issue which forces individual to interact via mobile chat even sitting side by side.
7. It helps to develop a part of 'extended family' but sometimes its addiction sometimes alienates people even within their home.
8. It also affects person's possibility of creative growth since it is easy to 'ask someone' than 'to think' on your own. Therefore 'to talk more and think less' can make people mentally lazy.

2.3 Popularity of M-learning in India:

Mobile phones are now an everyday gadget for people across the globe. The number of mobile phone users in the world is expected to pass the five billion mark in 2019. Mobile phone users in India crossed 581 million users in 2014 and have been on a steady rise over the last decade. According to a survey by eMarketer in 2015, India is estimated to have over 800 million mobile phone users in 2019. [4]

This huge number of people are using mobile phones does not mean they are serious learners. So term 'learning' in M-learning depends entirely on the will of the users that whether to take this technological opportunity as a mere time passing or as a part of conscious learning. But it is surely an important medium for libraries to reach its user communities with urgent and valuable academic information throughout the year.

2.4 Importance of M-learning in spreading LIS education:

The student's intention to adopt m-learning is influenced by several factors namely: relative advantage, complexity, social influence, perceived enjoyment, and self-learning management. [5]

2.4.1 LIS education through Facebook: There are many groups in Facebook which helps to spread LIS education with their regular posts. Some of them are created for notifying the upcoming seminars, conference and workshop in LIS domain. On the other hand some of them help LIS students to brush up their knowledge before competitive LIS exams and interviews. There are also departmental groups; research scholar's groups; working professional's groups and so on.

Some of the LIS Groups in Facebook and their respective number of Members

Sl. No.	Name of the Groups	Members following them
1.	LIS Research Scholars	2,356
2.	Library Science MCQs Practice	5,838
3.	LIS Professionals on Facebook	583
4.	WBCSC Interview	4,498
5.	LIS WEST BENGAL	1,149
6.	LIS Jobs Training Scholarships	2,891

Sl. No.	Name of the Groups	Members following them
7.	LIS Dates – Conferences/Seminars/Workshops	3,722
8.	LIBRARY SCIENCE – গ্রন্থাগার বিজ্ঞান	2,224
9.	World of Library and Information Science	33,479
10.	CENTRAL REFERENCE LIBRARY – Technical Staff Modernization vision	1,093
11.	RBU LIS FORUM	310
12.	Vidyasagar University, Dept. of Library & Information Science	898
13.	LIS Professional	913
14.	LIS Books Published World Wide	432
15.	It's All About the Library	7,209

[Note: The number of members can increase or decrease with the flow of time. The present data has been taken from Facebook profile on 10.11.2019 at 11.57AM]

2.4.2. LIS education through Whatsapp: WB LIS Forum, WBCSC-Librarian-interview, JU-DLIS etc. Whatsapp groups are very active and helpful by discussing new evolving issues in LIS field; posting regularly localized job information; and by posting question-answer series throughout the year for different competitive exams in LIS field.

2.4.3. Mail Correspondence: LIS education through personal mail correspondence and receiving group notifications through mail is also worth mentioning.

2.4.4. Personal Calls: Consulting with Human Resources via through personal calls also helps research scholars to a great extent.

3. Conclusion:

Thus it can be concluded that the importance of M-learning in spreading academic information is huge since most of the young generation Indians use to spend maximum time with their smart screens. Mobile has become an inseparable reality nowadays. This habit also enhanced the scope of connecting and discussing through Whatsapp, Facebook between the students, scholars and professionals of different subjects. Library professionals also use these platforms to disseminate information regarding upcoming exams; seminars, conferences, workshops, refresher courses, job vacancies and so on through departmental whatsapp group; official Facebook page and so on. In this way M-learning helps not only reaching the library users throughout the academic year but at the same time it helps in connecting LIS community globally; and thus can weave the students, scholars, LIS professionals and other academicians with the thread of virtual bonding.

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Student's awareness of mobile technology based academic library services and its implementation in Jadavpur University departmental libraries

Apala Chatterjee

Project Assistant, Dept. of Lib. and Inf. Sc., Jadavpur University, apalachatterjee0@gmail.com

Shampa Mahato

Ph D. Scholar, Dept. of Lib. and Inf. Sc., Jadavpur University, mahatopr12015@gmail.com

***Abstract:** This paper highlights on awareness of students of mobile technology based academic library services and how its' implementation can be made on the basis of a feedback survey. In this paper we report on surveys and offer an preliminary plan that librarians may use to begin implementing mobile access to different library practices and services. The survey concentrates on the study regarding the awareness and use of mobile devices for academic purpose and activities and their requirements for accessing library services and resources in particular. On the other hand, this survey among students, research scholars and professionals gives us an idea about services of libraries offered through mobile devices and technologies, users' opinions about whether and how mobile technologies may be useful to library activities. It also focuses on quantitative and qualitative data on students' use of mobile devices and to consider the benefit of academic mobile library services to students. It also investigates on which services students would find most useful on a mobile device.*

***Keywords:** Mobile technology, Mobile devices, Academic library services, Departmental libraries, Jadavpur University.*

1. Introduction

In the era of improved information and communication technologies, vast amount of changes are generated in facilitating communication and the transfer of information. Nowadays, it is not possible to provide all the information to the public manually but with the help of different technologies it is not very difficult to provide different services to its' users. The technology of mobile phone can be used as an information tool. Advancement of technology gives us easy way to search anything in the internet through mobile phones and other related technologies. Mobile phone also brings the library in the palm of our hand.

This study focuses on the nature of mobile phone use among academic library users at a higher learning institution and investigates their concepts and opinions about the mobile phone application in the context of library services. This has been done through a survey based study.

2. Objectives of the study

- To implement library and information services through mobile and other technologies in a better way;
- To aware students, academic users, research scholars and others about various types of mobile technology services provided by the library;
- To integrate different applications involving library services;
- To find out the problem and difficulties for implementing the mobile library service;
- To propose a suggestive frameworks for its future use;

3. The mobile web

Mobile web is nothing but the use of World Wide Web which allows access from mobile devices. Mobile device with internet connection gives facilities for accessing any web site from anywhere at any time. A mobile phone, such as a Smartphone, that connects to data or voice services in a wireless technique. With the advanced technology searching is easy in the internet through mobile phone. Like technologies, the libraries, archives, and others are also improving themselves to provide information in minimal time with less effort in a better way. On the other way, librarians also communicating with patrons through mobile services in effective ways.

4. Why academic library introduces mobile services?

- Mobile is now at everyone's door step, with the help of mobile service; library can represents themselves best in the information and communication world.
- Mobile library services can reach the goal for user satisfaction by applying different web based applications through mobile.
- Providing better access of information by 24*7 basis.
- To provide individual assistance and instruction.
- To educate users concerning resources and research techniques in order to help them become information literate.

5. Necessary requirements for implementing mobile-based library services

Mobile-based library services require digital technology. The following pre-requisites are as follows –

5.1 Library site development tools

The libraries can develop their own sites or interface with the help of some technologies – CSS (Cascading Style Sheets), Javascript, XML (eXtensible Markup Language), ADR (Auto-Detect and Reformat Software). These will help to navigate properly in the library sites.

5.2. Components

The users, the devices, the operating systems, the services, the content, the research tracking (how users currently engage with information on the world wide web via their mobile devices)

- PDA(personal digital assistance)
- Smart phones
- Cell phones

- Tablets
- Laptop and notebook computers
- Wireless terminals

6. Academic library services through mobile devices

A library can offer various types of mobile library services to the users. With the help of technological development and the increasingly use of smart phones with internet, it is now very much important for an academic library to provide services via mobile interface. The services are as follows –

- **Mobile OPAC service** – it is very much important to providing access to library catalog search, portable exhibit information, subject guides, e-journals and other library document search to a user who is studying on different subject or doing research.
- **SMS/Notification services** – It gives user ‘library instant access facility’. The users of the library may be notified by the SMS and MMS services. Library OPAC system is now mobiled facility of text message to check the availability and the details of books. Bringing new books in the library, users for suggestions, informing availability of reserved documents etc. can also be notified to the user through this service.
- **CAS & SDI** — Current Awareness Service is a form of service which provides news about current e-journal articles mainly for researchers. It can be made available to the users through wide range of mobile devices. Selective Dissemination of Information (SDI) service is a type of CAS mainly for selected users.
- **Instruction service**— library can provide directions of using materials like how to access e-documents, videos of different workshops, seminars, conferences etc.
- **Mobile circulation service**-- circulation of documents can be done through mobile devices by giving necessary information related to circulation like, the name of person who has loaned the material, due date i.e. the date of return of a specific material, particular fine policy for those who will not return the material within desired time period.
- **Database browsing**—library facilitates domain wise database searching such as Web of Science, Scopus, Jstor, OCLC's Worldcat etc.
- **Ask librarian service**—this service provides several efforts that meet user reference needs on smart phones and other mobile devices.
- **Online e-resource services**—library can provide e-books, e-journals, web databases, dissertations, images and article databases that can be used via mobile interface
- **QR codes on mobiles** – QR(Quick Response) code may be used to take a piece of information from a transitory media. Users can scan that code and decode the information with any mobile camera phone that has a QR reader, which is freely available online.
- **Audio-visual services (LibriVox, etc.)**—libraries can provide video conferencing service, live broadcast service, web streaming; educational programmes offered by televisions (films, slide-tape presentations, etc) can also be implemented through mobile.
- **Document delivery services via smartphones**
- **Document search in library**

- **New title arriving service**
- **E-learning resource database**
- **Readers' guidance service, etc.**

7. **Advantages of mobile technology in academic libraries**

- Time saving:** It can save useful time of users for finding necessary information
- User friendly:** With the help of different mobile phone technologies and services user can access information without much training and orientation
- Accessibility:** documents related to different information can be accessed very easily
- Personalized service:** users can get any type of reference information for a topic very quickly
- Mobility:** mobile devices can be easily carriable from one place to another.

8. **Drawbacks of mobile technology**

- Very costly
- Slow transmission speed
- Insufficient contents
- Lower rate of real time communication
- Less secure

9. **Methodology of the study:**

In the present study the methods applied here are based on descriptive process with the help of closed-ended and open-ended questions, informal interview and non-participant observation. Questionnaires are used for data collection which tries to explore the usage and awareness of mobile applications and technologies by students, research scholars and professionals.

The questionnaire consists of 10 questions with options to express answers from respondents regarding usage and awareness of mobile technology in library services. 150 Questionnaires were distributed among students, professionals and research scholars of four science discipline and four arts discipline departmental library of Jadavpur University. 120 questionnaires were received back from the respondents.

10. **Data analysis:**

The analysis of the study is presented through different tables —

Table 1: Course wise details of students

Sl. No.	Course	Responses received	Percentage
1	B. A./B.Sc/BLISc	30	53
2	M. A./M.Sc/MLISc	27	47

This table represents, 53% and 47% of the total respondents (i.e. 57) came from Bachelor and Master courses.

Table 2: Course wise details of research scholar

Sl. No.	Course	Responses received	Percentage
1	M.Phil	20	49
2	PhD	21	51

This table shows that 49% and 51% of the respondents came from M.phil and PhD courses.

Table 3: Designation wise details of Professionals

Sl. No.	Designation	Responses received	Percentage
1	Librarian	5	23
2	Asst. Librarian	7	32
3	staff	10	45

The above table depicts 23%, 32% and 45% of the respondents came from professionals of selected library departments.

Types of questions distributed among users (i.e. student, research scholar and professional)

Table 4: Awareness about smart phone and mobile applications

Sl. No.	Awareness	Responses received	Percentage
1	Yes	120	100
2	No	0	0

The above table shows that 100% respondents were aware about the Smartphone and mobile applications.

Table 5: Getting proper information through mobile phones

Sl. No.	Proper info.	Responses received	Percentage
1	Yes	70	58
2	Moderate	40	33
3	No	10	8

This table represents 58% of respondents were got proper information through mobile phones; 33% got moderate and only 8% did not get proper information through mobile phones.

Table 6: purpose of using smart phone and mobile devices

Here, 5 = mostly usable, 4 = frequently usable, 3 = usable, 2 = evenly, 1 = never usable

Sl. No.	Purpose for using smart phone	5	4	3	2	1
1	Texting	120	0	0	0	0
2	Games	56	31	12	19	2

3	Weather forecast	0	3	2	34	81
4	Social networking	120	0	0	0	0
5	Music	43	20	39	18	0
6	News	7	9	14	12	78
7	Sports	46	39	33	2	0
8	Shopping	13	25	67	15	
9	Video/movies	96	11	13	0	0
10	Surfing the web	120	0	0	0	0

This table depicts most of the respondents' purposes for using smart phone are – texting, social networking, surfing the web, video/movies. Many respondents chose games, music, sports and some chose news, shopping as purpose of using smart phone. Nobody used mobile phone for seeing weather forecast.

Table 7: applications used for instant messaging and communication

Sl. No.	Apps. for IM	Responses received	Percentage
1	Whats app	92	76
2	Chat on	2	1
3	Google Talk	3	2
4	Skype	0	0
5	Facebook Messenger	23	19

This table shows 76% of respondents used WhatsApp for instant messaging and communication; 19% used Facebook Messenger; only 1% and 2% used Chat on and Google Talk respectively.

Table 8: Having profile on social network sites (like, Facebook, Twitter etc.)

Sl. No.	Having profile	Responses received	Percentage
1	Yes	116	97
2	No	4	3

This table clears out 96% of respondents (i.e. 120) have profile on social network sites (like, Facebook, Twitter etc.); only 3% did not have profile on social network sites.

Table 9: Types of social network sites used by respondents

Sl. No.	Social network	Responses received	Percentage
1	Facebook	109	94
2	Twitter	2	2
3	Linkedin	0	0
4	Flicker	0	0
5	Instagram	5	4

This table shows out of 96% respondents having social network sites, 94% used Facebook; 2% and 4% used Twitter and Instagram; nobody used LinkedIn and Flickr.

Table 10: approximate hours per day spending on using smart phones

Sl. No.	Spending hours	Responses received	Percentage
1	Less than 1 hour	7	6
2	1-2 hour	13	11
3	2-3 hour	21	18
4	3-4 hour	26	22
5	4+ hour	53	44

Above table represents 44% of the respondents spent more than 4 hour per day; 22%, 18% and 11% spent 3-4, 2-3 and 1-2 hour per day; only 6% spent less than 1 hour per day on using smart phones.

Table 11: benefits of using mobile phones for educational purpose

Sl. No.	benefits of using mobile phones	Responses received	Percentage
1	Time saving/convenient	49	41
2	Saving transport cost	7	6
3	More secure transaction	9	8
4	Faster transaction	21	18
5	More private	7	6
6	Minimize risks	3	3
7	Lower cost	24	20

This table depicts 41% of the total respondents (i.e. 120) used mobile phones for the educational benefit of time saving; 18% and 20% respondents used mobile phones for faster transaction and lower cost; for the benefits of saving transport cost, more secure transaction, more private and minimize cost respondents used mobile phone 6%, 8%, 6% and 3% respectively.

Table 12: Suitability of using mobile phones for searching in educational purpose

Sl. No.	Suitability of using mobile phones	Responses received	Percentage
1	Yes	112	93
2	Moderate	8	7
3	No	0	0

The above table shows 93% of the respondents felt suitability of using mobile phones for searching in educational purpose; only 7% felt moderately suitable and no one felt unsuitability of using mobile phones for searching in educational purpose.

11. Analysis described:

The following important analysis can be drawn from the above tables and figures --

- Majority of the respondents have awareness about usage and alertness of mobile applications and technology.
- 58% of respondents were got proper information through mobile phones; 33% got information moderately.
- Texting, social networking, surfing the web, video/movies are the purposes for using smart phones of most of the respondents; Many respondents chose games, music, sports and some chose news, shopping as purpose of using smart phone.
- 76% of respondents used Whats app for instant messaging and communication; 19% used Facebook Messenger; only 1% and 2% used Chat on and Google Talk respectively.
- 96% of respondents have profile on social network sites (like, Facebook, Twitter etc.); only 3% did not have profile on social network sites.
- Out of 96% respondents having social network sites, 94% used Facebook; 2% and 4% used Twitter and Instagram; nobody used Linkedin and Flickr.
- 44% of the respondents spent more than 4 hour per day; 22%, 18% and 11% spent 3-4, 2-3 and 1-2 hour per day; only 6% spent less than 1 hour per day on using smart phones.
- 41% of the total respondents (i.e. 120) used mobile phones for the educational benefit of time saving; 18% and 20% respondents used mobile phones for faster transaction and lower cost; for the benefits of saving transport cost, more secure transaction, more private and minimize cost respondents used mobile phone 6%, 8%, 6% and 3% respectively.
- 93% of the respondents felt suitability of using mobile phones for searching in educational purpose; only 7% felt moderately suitable and no one felt unsuitability of using mobile phones for searching in educational purpose.

12. Conclusion:

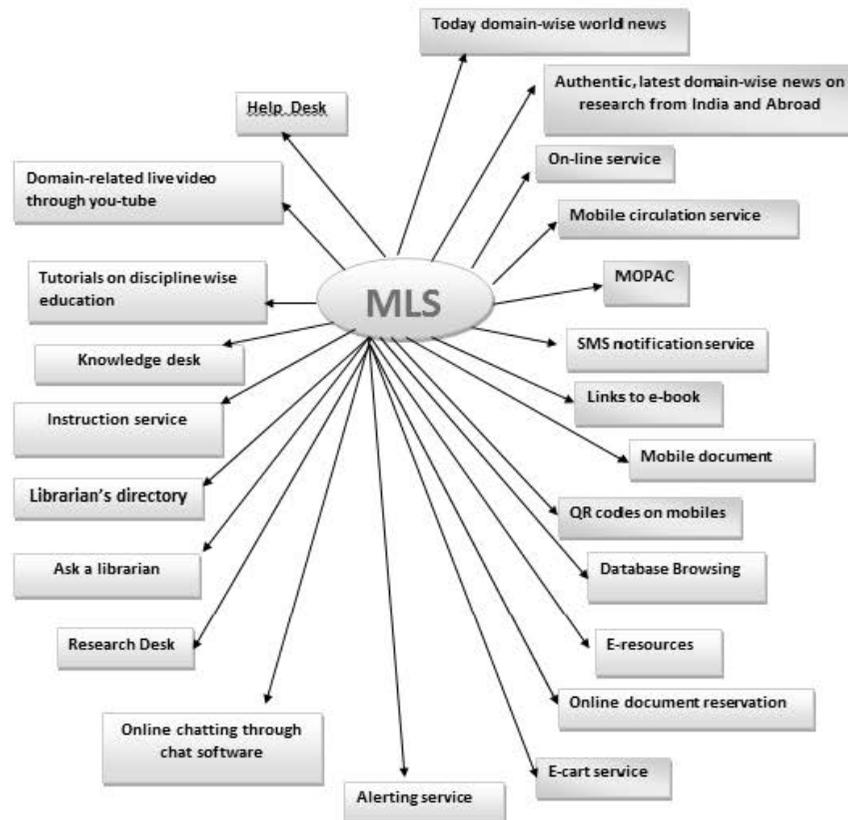
Mobile library services provide ways to reach out to smart phone and mobile users and increase library's relevance to users day-to-day activities. students, research scholars and professionals must try to explore new areas of implementation of mobile technology in more effective way. academic libraries can make new applications provided through mobile devices for disseminating its services to a large number of users. Application of mobile devices and technologies in different library services is the important need of today's world where smart phones and other mobile devices are reached already at grasp of our hand.

13. Suggestions:

From this study we can make notable suggestions which are described below:-

Library and information science professionals should learn about the open source platforms and its application in mobile technologies.

13.1 Suggestive Framework:



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Library at Your Service: Library Outreach Services

Proneeta De

Student of Master of Library and Information Science, Rabindra Bharati University
Email id: sneha.proneeta@gmail.com

Suman Saha

Student of Library and Information Science, Rabindra Bharati University
Email id: sumanblis19@gmail.com

***Abstract:** “Library” this small word has a great effect on human civilization. From primitive age to now digital age library has been a constant confidant of human growth and development. But public library is now in great danger and thought of sustainable library is coming into the scenario. Library outreach service is one of the key weapons to make library to regain people’s trust. This article deals with different types of outreach services that library can perform.*

***Keywords:** Outreach service; Mobile library; Library app; Social networking sites.*

1. Introduction

Library is a social as well as a public organization. So their works and services resolve around serving the public for a greater united society. But now –a-days library is losing its old glory and existence of public library is in front of big question mark. Library outreach service focuses on spreading library materials and services to each and every person who need this.

2. Definition

“Library programs and services designed to meet the information needs of users who are unserved or underserved.”

- ODLIS : Online Directory of Library and Information Science.[3]

So whenever we think about library services beyond four walls of library building we get outreach service, which means touching the lives of thousands to lakhs to crores.

3. Need of outreach service

When library gives outreach service , the primary thing that has to be remembered is :

- How many person will be get benefits?
- How much impact will this service have on the society?
- Can disabled and unnerved people are getting perfect and hassle-free service?

From this above questions we can clearly assume who are the prime target users of outreach service :

1. Disabled person
2. Special need groups
3. Willing but unable to use physical library materials.
4. Library is far away and impossible to go.

4. Outreach Services: Conventional services

o Mobile Library: Mobile Library is a very common service provided to the person who cannot come to the library. Trucks filled with books and other documents are sent from one place to another. Mobile Library in India was started in tribal villages of Roha in Maharashtra. Mobile Library is essential for-

- a) Disabled Person
- b) Old bed ridden person
- c) School going children who cannot go to library regularly

There are various names that are used to denote mobile library, they are:

- v Travelling Library
- v Library Wagon
- v Book Wagon
- v Book Truck
- v Library on Wheels
- v Book auto service etc.



Fig 1 : Mobile Library[1]

- o Door to Door Service: This is also like mobile library but it is much more personalized. In this service, the person who wants to enjoy the services provided by the library, orders the required documents to the library and the documents are delivered to him to his doorstep. This service is basically good for personalized library service where each and every users can be served. But this service can be shut down in the lack of proper staffing and transport system.
- o Library interactive program: Library has to be tryst place of person of different community, age, gender , social background etc.For this purpose library space can be utilized for organizing : [1]
 - v Book Fair
 - v Book display
 - v Different indoor games
 - v Quiz program and other interactive programs etc.

Not only light entertaining interactive programs but library can also organize some scholarly seminars, training program, workshops in different subject of interest for people from different subject field and age group. These will bring many people to the library and it will also help in their personal development.

This is basically called “Human Centered library planning”[2]. Various libraries have adopted this feature. Like Chicago Public Library every year “International Games Day” is celebrated where every person in the society are invited for participating in various board games and also to lend some documents . The purpose of this is to accumulate different kind of person in one place and have a great social meeting place where exchange of ideas and knowledge takes place in a phenomenal way .

- o Digital Library: Everyone of this century is accustomed with this term. Emergence of internet facility brings about the concept of digital library in front of general public. Digital library is an online repository of books and other reading materials in different format which are very helpful for modern tech-savvy users. Digital library has removed the barrier of place and time this facilitates the user to read anytime, anywhere, in any format and in a cost effective way.

5. Outreach Services: Unconventional Services

- o Library App: Now-a-days in the era of smart phone android apps are very much popular and useful , so as for libraries laso. In play store of any smart phone we can get various types of library apps.

The categories are :

- Book App –Kindle, Audio Books , E-books app(free or in purchase order)
- Library promotional App.

These two categories meet reader’s requirement of documents. But the second category that is Library promotional app is not so much developed till now. Some technical issues are there during designing this type of promotional app. But this type of app will help their users to get information about that particular library.

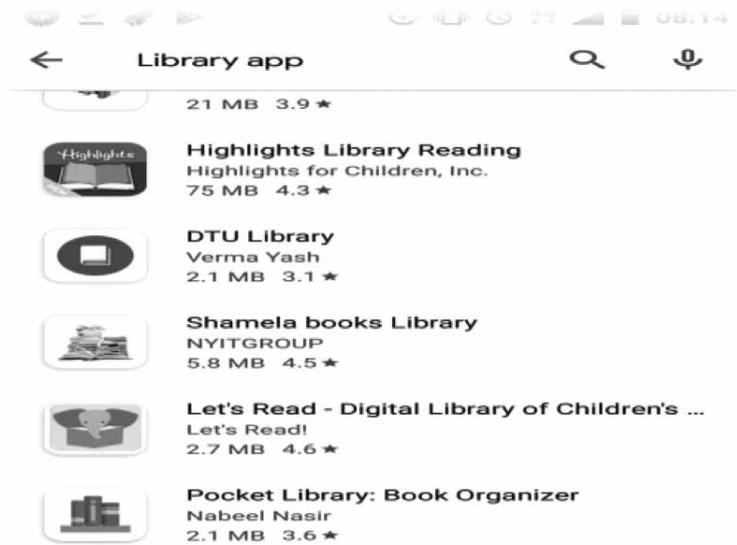


Fig 2 : Library App(Source : Google Play Store)

- o Social Networking Sites: In this age every people from the age group of 18-80 years are now immensely emerged in social networking site. Some well known example of social networking sites are Facebook, Whatsapp ,Twitter , LinkedIn etc. Many libraries have their own promotional page on these sites. But sad to say many of the person do not know about this and don't follow their page. Social networking site can be an excellent tool for providing information and user can communicate with libraries via personal chat system. Its an easy and hassle free way to reach to a larger community and also very cost effective way.

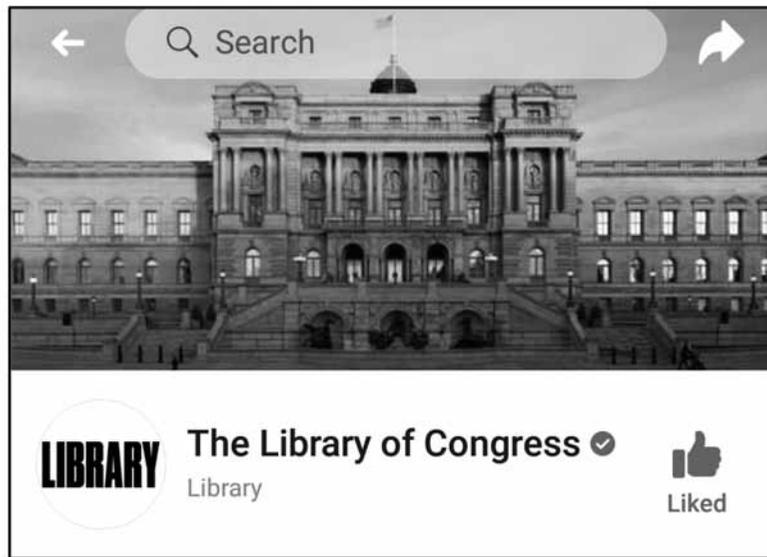


Fig 3. : Facebook Page of Library of Congress(Source : Facebook)

6. Evaluation of Outreach Service

Arrangement and implication of outreach service depends upon user acceptance. How much user are appreciating the approach of library is the main evaluation of any outreach service. As we all know this is only for user to help them proactively so their positive response is the biggest evaluation criteria of an outreach service. Cost benefit analysis should also be done to see how much it costs to that library.

7. Conclusion

Serving a large portion of population has always been a duty of public library. But in this competitive digital era person are losing their trust on library and becoming more depending upon online sources. So as a library professionals we have to think from both perspective : as a public and for the public. That's where the need of outreach services to build the trust again on the libraries for sustainable future. But we have to make our users aware of such services so that this can be spread in a bigger form to each and every person.

“A Library could show you everything if you knew where to look.”

-Pat Corony.[4]

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An Overview of Metadata in Today's Resource Management from Ranganathan's Perspective

Sukanya Mandal

M Phil Student, Dept. of Lib. & Inf. Sc., Jadavpur University,
Email: sukanya24.mandal@gmail.com

Falguni Ghosh

Project Fellow & M Phil Student, Dept. of Lib. & Inf. Sc., Jadavpur University
Email: flgnghsh@gmail.com

Sonia Ghosh

M Phil Student, Dept. of Lib. & Inf. Sc., Jadavpur University
Email: soniaghosh065@gmail.com

***Abstract:** Metadata identifies machine readable information to locate and describe digital resources. Metadata is information about information which allows navigating, finding and managing information. Cataloguing is the process of creating metadata which represents information resources - books, sound recordings, moving images, etc. In the library catalogue, the entries fulfill all the purposes of library services. This paper gives an overview of metadata. For studying in depth this paper analyses three metadata schemes – DCMI, METS, MODS. This paper also discusses about the importance, applications of metadata from the Ranganathan's viewpoints.*

***Keyword:** Metadata; Collection Management; DCMI; METS; MODS; Ranganathan.*

1. Introduction

Academic libraries have a lot of services to offer. The librarians serve their expertise in retrieval skills, metadata, information and knowledge management. In context of library catalogue, each entry serves information to arrange on the shelves. It refers to a set of data that describes and gives information about other data. Cataloguing is process of creating metadata representing information resources, such as books, sound recordings, moving images, etc. For a very long time libraries and librarians have been involved with metadata which called cataloguing rules, controlled vocabulary, indexing format etc. Then it introduced as a set of conventions to enable machine exchanges of cataloguing records. MARC 21 and set of rules used with AACR2 and metadata standards, Metadata includes bibliographic information. In recent development of digital libraries, Librarians have joined the other efforts related to metadata. Metadata is data about data, Information about information. Metadata identifies, locates and or describes web resources. Metadata is made up of various elements which can be fulfilled various requirements. Metadata serves many important purposes - data description, data browsing, data transfer, and metadata has an important role in digital resource management. This paper gives an overview of metadata in the context of resource management. In the card catalogue, every individual card contained the title of the

book, subject of the book, author, date of publication, pages of the book. Those card catalogues were similar to metadata. It can be said that this catalogue card is a form of metadata. There are various types of metadata standard. A metadata standard supports numerous defined functions and elements. The study analyzes the mostly popular three metadata – DCMI, METS, MODS. There are numerous efforts to apply the Ranganathan’s contribution to more recent trends in resource management especially electronic materials and the web. The study also tries to examine the concept of metadata from the viewpoints of Ranganathan.

2. Objective

- To give an overview and importance of metadata.
- To study the application of metadata in today’s resource management.
- To examine the metadata schemes.
- To analyze the efficacy of metadata from the Ranganathan’s viewpoints.

3. An overview of Metadata

Metadata describes representation of content, context, structure, quality, province, condition, and other characteristics of document to help user for retrieve, discovery, evaluation, access, transfer, and cite the document.

3.1. Definition

Metadata are structured on data, also capture important contextual details about data and provide information. However, metadata contains information specifically on type, length, textual description and other characteristics.

3.2. Features

Three main features are describing metadata very clearly:

- Ø **Structure**
- Ø **Context**
- Ø **Content**

3.3. Types of Metadata

There are specialized and well-accepted specific types of metadata.

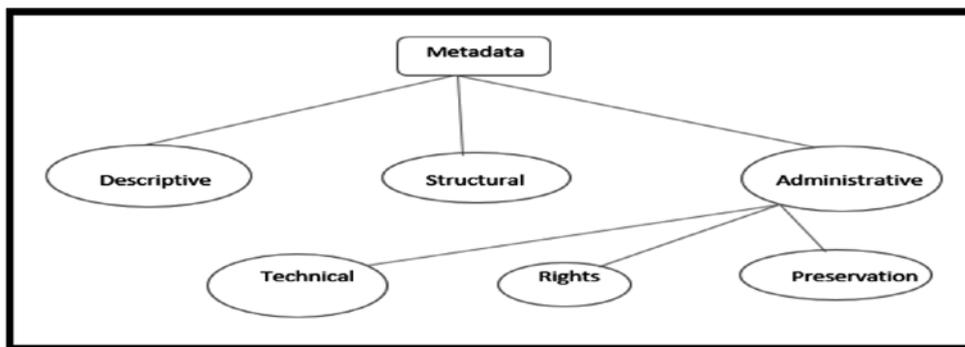


Figure 1: Types of Metadata

4. An analysis of selected metadata standards

Metadata Standards

Metadata standard is represented semantics of data. Metadata standards grouped into sets designed for a specific purpose for a specific domain or a particular type of information sources which are known as metadata schemas. There are large number of metadata standards which defines the needs of particular user communities. E.g. AGLS, ANZLIS, CIMI, DCMI, EAD, ENDA, METS, MODS, GILS, TEI, VRA and so on. The study are selected three very popular metadata standards for the fulfilment of our article.

Dublin Core Metadata Initiative: Dublin Core metadata standard is a simple yet effective element set for describing a wide range of networked resources.

Table 1: Conceptual Framework of DCMI

Name of the standards	Origin	Types	Features	Application	Advantages/Disadvantages
Dublin Core Metadata Initiative	Dublin refers to Dublin, Ohio, USA 1995, hosted by the OCLC (Online Computer Library Center), this library consortium in related in Dublin, and the National Center for Supercomputing Applications (NCSA). The Dublin Core Schema is a small set of vocabulary terms that used to describe digital resources (video, images, web pages, etc.), as well as physical resources such as books or CDs, and objects like artworks. The full set of Dublin Core metadata terms can be found on the Dublin Core Metadata Initiative (DCMI)	<p>DCMIES V1.1 consists of 15 metadata elements, defined this way in the original specification:</p> <p>Contributor – An entity responsible for making contributions to the resource.</p> <p>Coverage – The spatial or temporal topic of the resource, spatial applicability of resource, or jurisdiction under which resource is relevant.</p> <p>Creator –An entity primarily responsible for making resource.</p> <p>Date – A point or period of time associated with an event in lifecycle of resource.</p> <p>Description –An account of the resource.</p> <p>Format – The file format, physical medium, or dimensions of resource.</p> <p>Identifier – An unambiguous reference to resource within a given context.</p> <p>Language –A language of resource.</p> <p>Publisher –Entity responsible for making resource available.</p> <p>Relation – A related resource.</p> <p>Rights – Information about rights held in and over resource.</p> <p>Source - Related resource from which described resource is derived.</p> <p>Subject –Topic of the resource.</p> <p>Title – Name given to resource.</p> <p>Type – Nature or genre of the resource.</p>	All Dublin Core elements are considered optional & repeatable There is no prescribed order to elements nor any required elements DC can be used with controlled vocabularies but does not require them Qualified Dublin Core adds to Simple Dublin Core to make elements specific Includes additional elements such as Audience, Provenance, that are not present in Simple Dublin Core Qualifier	This simple uses Dublin Core by itself to describe an audio recording of a guide with XML or RDF/XML, Dublin Core can potentially be mixed with other metadata vocabularies. Minimal standard for OAI-PMH Core element set in some other schemas Switching vocabulary for more complex schemas	<p>Advantages Less rigorous content rules. Easier to train and implement. Allows OAI harvesting metadata. Supported by digital library products: ContentDM, Encompass MetaSource. International and cross-domain developed via an open review process. Increased efficiency of the discovery/retrieval of digital objects</p> <p>Disadvantages: Lack of granularity not support specific community needs. Lack of granularity makes its role as a switching language. Lack of consistent training can hamper interoperability.</p>

Table 2: Elements of DCMI

Elements	Elements Description	Example
1. Title	Name given to resource.	Title="A Pilot's Guide to Aircraft Insurance"
2. Subject	Topic of content of resource.	Subject="Aircraft leasing and renting"
3. Description	Account of content of resource.	Description="Illustrated guide to airport markings and lighting signals, with particular reference to SMGCS (Surface Movement Guidance and Control System) for airports with low visibility conditions."
4. Type	Nature or genre of content of resource.	Type="Image" Type="Text" Type="Software" Type="Interactive Resource"
5. Source	A Reference to a resource from which present resource is derived.	Source="Image from page 54 of the 1922 edition of Romeo and Juliet"
6. Relation	A reference to a related resource.	Title="Candle in the Wind" Subject="Diana, Princess of Wales" Date="1997" Creator="John, Elton" Type="sound" Description="Tribute to a dead princess." Relation="Elton John's 1976 song Candle in the Wind"
7. Coverage	Extent or scope of content of resource.	Coverage="Upstate New York"
8. Creator	An entity primarily responsible for making content of resource.	Creator="Internal Revenue Service. Customer Complaints Unit"
9. Publisher	Entity responsible for making resource available	Element Description: Publisher="Carmen Miranda"
10. Contributor	Entity responsible for making contributions to content of resource	
11. Rights	Information about rights held in and over resource.	Rights="http://cs-tr.cs.cornell.edu/Dienst/Repository/2.0/Terms"
12. Date	A date associated with an event in life cycle of resource.	Date="1998"
13. Format	The physical or digital manifestation of resource.	Title="Dublin Core icon" Identifier="http://purl.org/metadata/dublincore/images/dc2.gif" Type="Image" Format="image/gif" Format="4 kB"
14. Identifier	An unambiguous reference to resource within a given context.	Identifier="ISBN:0385424728"
15. Language	: A language of intellectual content of resource	Language="en-US"
Examples of the Dublin Core Metadata		
<pre> <meta name="dc.language" CONTENT="UK"> <meta name="dc.source" CONTENT="http://www.your-domain.com/"> <meta name="dc.relation" CONTENT="http://www.second-domain.com/"> <meta name="dc.title" CONTENT="a title"> <meta name="dc.keywords" CONTENT="more keywords"> <meta name="dc.subject" CONTENT="the subject"> <meta name="dc.description" CONTENT="A description of the content"> </pre>		

METS: Metadata Encoding and Transmission Standards is a data encoding and transmission, specification and expressed in XML which means to convey metadata for management of digital objects within a repository.

Table3: Conceptual Framework of METS

Name Of The Standard	Origin	Features	Application	Advantages
Metadata Encoding and Transmission Standard (METS)	The METS XML schema was created in 2001 under the sponsorship of the Digital Library Federation (DLF), is supported by the METS Editorial Board. In 2004 it received NISO Registration, which was renewed in 2006 of that year.	A metadata standard is used for encoding format for descriptive, administrative, and structural metadata for textual and image based tasks to a digital library. It is expressing to use the XML schema language of the World Wide Web Consortium (W3C). The standard is maintained as part of the MARC standards of the Library of Congress, and It is developed as an initiative of the Digital Library Federation (DLF).	METS provides: flexible mechanisms for – expressing structure or structures of a digital elements. Linking with both simple and complex content Linking structure with descriptive metadata Linking structure and content files with administrative metadata	METS Provides an XML document format for encoding metadata to both digital objects within a repository and exchange of some objects between Repositories or their users.

Table 4: Sections of METS

Name of Section	Description	Example
METS Header-	The METS Header contains metadata which describes METS document such as information as creator, editor, etc.	<pre> <metsHdr CREATEDATE="2003-07-04T15:00:00" RECORDSTATUS="Complete"> <agent ROLE="CREATOR" TYPE="INDIVIDUAL"> <name>Jerome McDonough</name> </agent> <agent ROLE="ARCHIVIST" TYPE="INDIVIDUAL"> <name>Ann Butler</name> </agent> </metsHdr> </pre>
Descriptive Metadata-	Descriptive metadata section may point that type of metadata external to the METS document. Multiple instances of both external and internal descriptive metadata included in descriptive metadata section.	<pre> <dmdSec ID="dmd001"> <mdRef LOCTYPE="URN" MIMETYPE="application/xml" MDTYPE="EAD" LABEL="Berol Collection Finding Aid">urn:x-nyu: fales1735</mdRef> </dmdSec> </pre>
Administrative Metadata-	Administrative metadata section lights up on the information regarding files creation and stored, intellectual property rights, metadata regarding original source object from which digital library object derives, and information regarding the provenance of the files comprising the digital library object.	<pre> <file ID="FILE001" ADMID="AMD001"> <FLocat LOCTYPE="URL">http://dlib.nyu.edu/press/testimg.tif</FLocat> </file> </pre>
File Section-	This section lists all the files which contains content comprise with electronic versions of digital object. <file> elements may be grouped within <fileGrp> elements, to provide for subdividing files by object version.	<pre> <fileSec> <fileGrp ID="VERS1"> <file ID="FILE001" MIMETYPE="application/xml" SIZE="257537" CREATED="2001- 06-10"> <FLocat LOCTYPE="URL">http://dlib.nyu.edu/tamwag/beame.xml </FLocat> </file> </fileGrp></fileSec> </pre>
Structural Map-	The structural map is core area of a METS document. It structures a hierarchical form for digital library object, and links elements to the structure.	<pre> <structMap TYPE="logical"> <div ID="div1" LABEL="Oral History: Mayor Abraham Beame" TYPE="oral history"> <div ID="div1.1" LABEL="Interviewer Introduction" ORDER="1"> <fptr FILEID="FILE001"> <area FILEID="FILE001" BEGIN="INTVWBG" END="INTVWWD" BETYPE="IDREF" /> </div> </fptr> </pre>
Structural Links-	METS creators to record existence of hyperlinks between nodes in hierarchy outlined in Structural Map. This is of particular value in using METS to archive Websites.	<pre> <xlink:from="IMG1" xlink:to="P2" xlink:title="Hyperlink from JPEG Image on Page 1 to Page 2" xlink:show="new" xlink:actuate="onRequest" /> </pre>

<p>Behavior</p>	<p>This behavior section can be used to associate executable behaviors with content in the METS object.</p>	<pre><METS:behavior ID="DISS1.1" STRUCTID="S1.1" BTYPE="uva-bdef:stdImage" CREATED="2002-05-25T08:32:00" LABEL="UVA Std Image Disseminator" GROUPID="DISS1" ADMID="AUDREC1"> <METS:interfaceDef LABEL="UVA Standard Image Behavior Definition" LOCTYPE="URN" xlink:href="uva- bdef:stdImage"/> <METS:mechanism LABEL="A NEW AND IMPROVED Image Mechanism" LOCTYPE="URN" xlink:href="uva- bmech:BETTER-imageMech"/> </METS:behavior></pre>
<p>How to construct METS file</p> <pre><dmdSec ID="dmd002"> <mdWrap MIMETYPE="text/xml" MDTYPE="DC" LABEL="Dublin Core Metadata"> <xmlData> <dc:title>Alice's Adventures in Wonderland</dc:title> <dc:creator>Lewis Carroll</dc:creator> <dc:date>between 1872 and 1890</dc:date> <dc:publisher>McCloughlin Brothers</dc:publisher> <dc:type>text</dc:type> </xmlData> </mdWrap> </dmdSec> <dmdSec ID="dmd003"> <mdWrap MIMETYPE="application/marc" MDTYPE="MARC" LABEL="OPAC Record"> <binData>MDI0ODdjam0glDIyMDA1ODkgYSA0NU0wMDAxMDA...(etc.) </binData> </mdWrap> </dmdSec></pre>		

MODS: Metadata Object Description Schema is an XML based bibliographic description schema. MODS provide 10 top level elements to describe the broadest facets of an object. Following elements are going to give a brief overview about the MODS elements.

Table 5: Conceptual Framework of MODS

Name Of The Standard	Origin	Features	Application	Advantages	Disadvantages
Metadata Object Description Schema (MODS)	The Library of Congress' Network Development and MARC Standards Office, with interested experts, developed the Metadata Object Description Schema (MODS) in 2002 for a bibliographic element set.	<p>1)The elements generally inherit the semantics of MARC</p> <p>2)Some data has been repackaged; in some cases what is in several data elements in MARC may be brought together into one in MODS</p> <p>3)MODS does not assume the use of any specific cataloging code</p> <p>4)Several elements have an optional ID attribute to facilitate linking at the element level.</p>	<p>MODS could potentially be used as follows:</p> <ul style="list-style-type: none"> ➤ as an extension schema to METS (Meta data Encoding and Transmission Standard) ➤ to represent metadata for harvesting ➤ for original resource description in XML syntax ➤ for representing a simplified MARC record in XML ➤ for metadata in XML that may be packaged with an electronic resource 	<p>MODS is intended to complement other metadata formats. For some applications, particularly those that have used MARC records, there will be advantages over other metadata schemes. Some advantages are:</p> <p>1)The element set is richer than Dublin Core</p> <p>2)The element set is more compatible with library data than ONIX</p> <p>3)The schema is more end user oriented than the full MARCXML schema</p> <p>4)The element set is simpler than the full MARC format</p>	<p>MODS includes a subset of data from the MARC 21 Format for Bibliographic Data.</p> <p>1)allows for the representation of data already in MARC-based systems.</p> <p>2)allow for the conversion of core fields while some specific data may be dropped.</p> <p>3)allows for a simple record to be created in some cases using more general tags than those available in the MARC record.</p> <p>4)MODS and then the specific data could be lost when converting to MODS.</p>

Table 6: Elements of MODS

Elements	Description	Example
<u>titleInfo</u>	This is compulsory top level element titleInfo may be qualified by a number of attributes	<mods> <title info> <title>Metadata demystified</title> </titleInfo>
<u>name</u>	This element is for creation of intellectual content.	<name type="personal"> <namePart type="family">Brand</namePart> <namePart type="given">Amy</namePart> </role>
<u>typeOfResource</u>	it's the type of object like text, multimedia etc.	<roleTerm authority="marcrelator" type="text">author</roleTerm> </role> </name> <typeOfResource>text</typeOfResource>
<u>genre</u>	It is a detailed character of item, resource type	<originInfo> <dateIssued>2003</dateIssued> <place> <placeTerm type="text">Bethesda, MD</placeTerm> </place> <publisher>NISO Press</publisher> </originInfo>
<u>origin info</u>	It brings information together on the publication of the item.	<identifier type="isbn">1-880124-59-9</identifier> </mods>
<u>language</u>	It gives information about the language of the document.	
<u>physical description</u>	It Contains a variety of sub elements which allow a basic description of the objects physical description.	
<u>abstract</u>	Description of the intellectual content of the item or a link to a description of this kind.	
<u>tableofcontents</u>	A listing of the contents of the item, which may either be recorded explicitly or provided as a link to such a list.	
<u>targetaudience</u>	This element defines about the intended user of the document.	
<i>as per need to create item.</i> 1.Target audience 2.Note 3. Subject 4.Classification 5.Related item 6. Identifier 7. Location 8. Access conditions 9. Part 10. Extension 11. Record Info		

5. Importance of metadata in Ranganathan's perspective

- Many phenomena are influencing various aspects of Ranganathan's trinity. "In Ranganathan's view, a library Comes into existence only when readers, books, and staff functions together. Readers, books, and staff from the trinity in a library (Bianchini&Guerrini, 2014)." Metadata is mostly use in information technology to make easier the process for finding the data. It plays the one of vital role in context of Ranganathan's trinity. A metadata standard is aimed to establish to understand a common meaning or semantics of the data which helps to ensures proper use, interpretation of data and consistency in metadata application. It must become an integral part of the semantic web; they must remember the Ranganathan's trinity.
- There are numerous efforts to apply the five laws to more recent trends in information services, most specially in web. Metadata also helps organize electronic resources, provide digital identification, and archive and preserve resources. Metadata uses for preservation, access at any time – which related to first law "Books are for use". Second and third law also related to the purpose of using the metadata. In today, readers are moved from libraries to the web and also required more and more emphasis on completion of the law "Save the time of the reader." Metadata are used to navigate, search collect and metadata will have to be more full navigation capabilities, such as following links from a resource description to its full text, and also links among similar resources. Fifth law is mostly suitable for digital environment.
- Ranganathan's canons of cataloguing guides to achieve uniformity, consistency and accuracy. Metadata allows users to access resources through allowing resources to be found by relevant criteria, identifying resources, bringing similar resources together, distinguishing dissimilar resources, and giving location information – which are also related to Canons of Cataloguing. Metadata has also conformity with Ranganathan's law and principles of cataloguing such as Law of Interpretation.
- BIBFRAME is a model, developed to represent metadata from libraries in linked data form. "In Ranganathan's approach, work and instance would not be sufficient to properly describe bibliographic phenomena, as he organized documents conceptually in three levels, not two, based on Indian culture: work, expression, and physical medium. Compared with Ranganathan's approach, BIBFRAME is a simplification, but the main point is that it is an expression of the willingness of libraries to achieve near-universal adoption of data exchange standards, and to respond to Semantic Web requirements (Bianchini &Guerrini, 2014)."
- "The equivalent of the toy components became what Ranganathan called isolates, or what we would today call metadata values. Those values all fit within one of Ranganathan's five basic areas of classification: personality, matter, energy, space, and time. His system classified books by combining the isolates for each of those five areas (Weinberge, n.d.)." To classify any subject, it is required that fundamental categories to get metadata values in a given subject or wholeness of subject.

6. Conclusion

Metadata is playing key role in resource management, digital information system. Metadata is structured information to describe, explain, locate and also makes it easier to retrieve and use an information resource. Metadata is set of data that describes and gives information about data. In short it describes "data about data". Metadata describes other data where "Meta" is prefix which is mostly use in information technology. Basic information about data summarizes by Metadata which can make easier the process for finding the data. The study analyzes the concept of metadata and examines the metadata schemes. From above study It can be seen that Ranganathan's contributions have relevance even today as because

they were built on the basis of a strong theory. But the only problem is that there is no provision for capturing data different forms of information available today. But his theory never be obsolete there will be needed to further study.

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Marketing of Public Libraries Products and Services

Souvik Dasgupta

Student, DLIS, Rabindra Bharati University, E-Mail: shuwoodasgupta@gmail.com

Madhuj Das

Student, DLIS, Rabindra Bharati University, E-Mail: madhuj1996@gmail.com

Victor Tunomukumo Nelumbu

Student, DLIS, Rabindra Bharati University, E-Mail: mcvictorn@gmail.com

***Abstract:** The term marketing on the purpose of library and information products are not the same what people generally think it is. This concept is related with the creating of products and services to fulfill the needs of users and to attract them in library services. In this recent era the concept has been changed. Instead of reaching out to users for services in the library or information center, the information and services must reach the user's own place. S.R. Ranganathan also realized the idea of applying marketing principles to library activities. Public libraries can be endangered if they don't add more services and make them attractive for users. Public libraries are mostly running under limited budget and less employee. So, it's a big challenge to marketing its services to the users. This paper provides a brief description of the impact of marketing, its tools, implications, and marketing strategies of a public library.*

***Keywords:** Marketing of LIS products; Public Library; Information Services*

1. Introduction

In our general thought libraries and information centers are not a profit making organization but in this era of Information Communication Technology (ICT) the situation has changed due to adoption of new technological storage, processing, retrieval and services. Libraries and information centers accept a challenge to satisfy the user's need by managing and promoting their information resources and services. Libraries and information centers play a big role in our society but the sudden rise of some commercial information service providers can affect the progress of their growth. In this digital age, library's collection continue to move their information resources from print to electronic formats, therefore the challenges of effective marketing of those resources has become apparent.

2. Definition of Marketing

Marketing involve steps for selling any product based on the customers' demands and to generate money. Saul Colt define the term marketing as "Creating irresistible experiences that connect with people personally and create the desire to share with others." According to Dr. Augustine Fou, "Marketing is the process of exposing target customers to product through appropriate tactics and channels, gauging

their reaction and feedback, and ultimately facilitating their path to purchase”. The basic purpose of marketing is to increase the user satisfaction and achieving the organizational goals.

3. Needs of Marketing of LIS products

Now-a-days marketing of LIS products and services are attracting the attention of research scholars, market researcher and other professionals. Libraries have started to emerge relatively recently in the marketing area especially for developing countries like India. The approach of marketing the LIS products are very much useful for the academic (university and other educational institutions) and special libraries to improve their image and to attract more users.

There are some basic needs for which public libraries feel the necessity for marketing their LIS products:

- a) To ensure the maximum use of its reading materials.
- b) To satisfy the needs of the users.
- c) To improve their image and gain acceptance among sponsors, government agencies, news media, and of course, customers, all of which collectively determine an organization’s success (Stanton, 1994).
- d) Marketing of information product plays an important role in achieving the predetermined goals of the library and information centers.
- e) To save libraries from declining reader-support.

4. Marketing in Public Libraries

From the IFLA (UNESCO Public Library Manifesto 1994) given definition we can identify some characteristics that public libraries are “local centre of information”, “equality of access for all”, for “all age group” and “nor commercial pressures” etc. They clearly mentioned that “The public library shall in principle be free of charge”. It’s clear that public libraries are mostly maintained for public use and funded by the government fund. The role of public libraries are very much significant in our society to provide free (non-formal) education, information, to develop personality, to economic development, for to reserving culture and more. Then, is it against the policy of being a profitable organization of a public library? Stover said, “Consciously or not, all librarians engage in marketing activities all the time.... if you are planning or implementing services, constructing Web pages, conducting needs assessments, promoting events[,] or interacting with patrons, you’re marketing”(Stover,2006). Now in the era of marketing library users can pointed as customers.

5. Implication of Marketing Techniques in Library

Marketing strategies depend on the types of the library organization, resources and users. This is relatively a complex process. A librarian can either employ an outside expert or do it by himself/herself. Ojiambo (1994) identified five stages to apply marketing techniques in any library or information center.

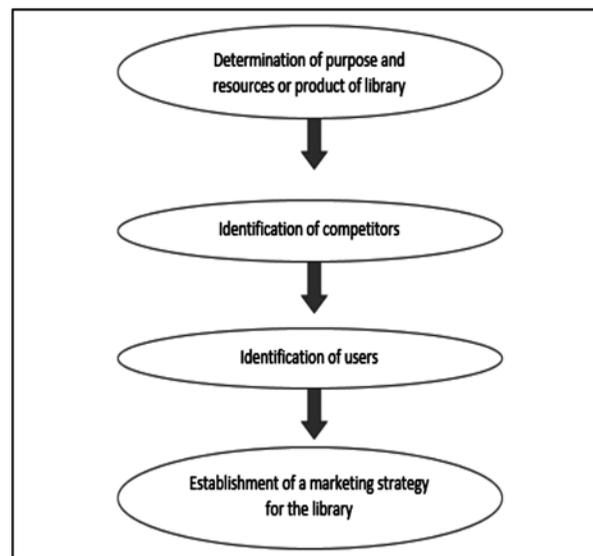


Figure 1: Four Steps of the Implication of the Marketing Techniques in Library

6. Market Research & Branding

Market research is a systematic process of collecting, analyzing and interpreting information about the market, customers and their needs. It helps entrepreneurs make well-informed decisions. So, before introducing any service, the public libraries should have a better understanding of user's needs. In the other side branding is a very important part of the marketing process. It is the process of examining what the library does, what the library stands for and what the library means to different people.

7. Marketing Campaigns

In order to meet the goals of the public library, the aspects of marketing campaigns need to be properly planned. There are several types of campaigns to gain public awareness like-

- Exhibition campaigns
- Collections campaigns
- Visitor campaigns
- Income generation campaigns
- Generic corporate campaigns etc.

8. Marketing Campaign Strategies

The strategies specify the campaign objectives by identifying the most appropriate target customers, ensure the right message is going to the right customer through the right channel and use the marketing mix to the best effect.

The Marketing mix: This step develops Product, Price, Place and Promotion of materials to achieve marketing goals. This 4Ps was identified by McCarthy. Later, M.N. Munshi extends the concept of 4Ps by adding People and Process for the libraries and information centers.

8.1 Product: An item or a thing that can be offered in a market for the satisfaction of human needs. The

products can be services, information, ideas, experience, persons or places.

- **Types of public library product: Periodicals:** Journals, magazines, newspapers, newsletter.
- **Reference documents:** Encyclopedia, dictionaries, directories, state of the art report etc.
- **Books:** All fictions and non-fictions.
- **Other products:** CD-DVD and other multimedia products, government publications etc.
- **Services:** CAS, SDI, reprographic services, alerting services, OPAC services, helpdesk services etc.

8.2 Price: Pricing is the process whereby a business sets the price at which it will sell its products and services, may be part of the business's marketing plan. Some services of a public library include service charges are -

- Library Membership fees.
- Library resource access fees for non-member users
- Reprographic service charges
- Charges for SDI services
- Any other goods and services charge.

8.3 Place: Place is the marketing term for describing where the product or service is offered (Leisner, 1995). Product must be available at the right time and the proper location. The beautiful geographical location of the library attracts users. Of course, the library will be located in an area where public meetings are high and easy to reach.

8.4 Promotion: This is how the library communicates and attracts the target customers. It educates the customers about the products and services given by the library. Promotion includes selling, advertising, publicity, public relations and packaging. This may include:

- **Print:** Promotion can be done by preparing posters, banners, leaflets etc.
- **Advertising:** Advertising can be done through newspaper, magazines and online to promote the services. But they are cost-effective.
- **Mail:** Using the in-house databases posters or leaflets can be sent to the peoples.
- Public Relation using **socialmedia**.

8.4.1 Why social media:

- (1) Increase the visibility of the library and its activities
- (2) Encourage word-of-mouth marketing
- (3) Build collaborative network with the users
- (4) Helps to locate library resources
- (5) Reinforce the mission and vision of the library
- (6) Using social media is mainly free of cost

8.4.2 Right social media platform for public library marketing:

- (1) For event and program promotion: Facebook/Twitter
- (2) For Storytelling: Facebook/Instagram/YouTube
- (3) For sharing news: Facebook/Twitter/YouTube
- (4) For connecting with authors: Twitter/Facebook/Instagram
- (5) For connecting with community: All of the above social network platforms.



Figure 2: Facebook page of St. Josephn Public Library is promoting an event

8.4.3 Library Website: It acts as a great help for the users if a public library have a website of its own, as in today's time people generally check website to seek any kind of information. Library websites play a big role in their marketing. Websites of Public libraries can provide the details like- location, library hours, membership procedure, collections of printed and e-materials, upcoming events, newsletter etc.



Figure 3: Home page of Charlevoix Public Library’s website

9. Evaluation

Effective marketing methods require timely evaluation. Thus it is very important to evaluate the effectiveness of the marketing programs to analyze and decide the continuance renovation and discontinuance of the different products and services. Regular user surveys are needed to review how well each service matches with users’ needs and demands.

10. Conclusion

The role of public library is at the forefront of every civilized society. If the library products and services are not properly marketed, the number of users will continue to decrease. Public libraries can adopt different approaches for this marketing work; although some of the marketing processes are expensive, many can be easily done without any expense. Although the library budget is very limited but there is no difficulty, marketing requires the personal initiative and desire of librarians. An attractive Facebook page or a well maintained library website, occasionally distributing leaflets will obviously attract a large number of people. Marketing of library services and products are very much needed to keep public libraries sustainability.

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Usage and user satisfaction level of E- Resources: An Empirical study on the Students of Dhaka University

Mubassira Mahmuda

University of Dhaka, Bangladesh, E-mail: mmsupty@gmail.com

M. Monirul Islam

PhD Research Scholar, Jadavpur University, Kolkata – 700032.

E-mail: kanokmonir@gmail.com

Abstract

Purpose – The main focus of this paper on Uses of E-Resources and satisfactory rate of E-Resources services among the graduate and post graduate students of University of Dhaka from different faculties and subjects. This paper explore the reasons of usage of E-Resources, satisfaction rate, barrier of using E-Resources and recommendation for accelerating the satisfaction rate of student in the University of Dhaka.

Design/methodology/approach–For this study we depend on the survey questionnaire and the interview method to the perceptions of students of Dhaka University. The questions are related with the using of E-resources and the satisfactory rate of students towards the e-resources. Documentary sources, review literature, copulation of secondary information, taking interview with some students and the direct observation are the major methods of this article.

Findings –Result showed that there are some problem and obstacles in the way of using electronic resources. In spite of having some constraints in using electronic resources, the students of University of are highly satisfied with these electronic resources.

Originality/value –This paper has been made to assess the present states of usage of electronic resources, reason for using electronic resources, obstacles in the way of electronic resources and user satisfactory rate of the students of University of Dhaka

Keywords: Resources; E-Resources services; User Satisfaction.

1. Introduction:

In the age of information explosion e- resources is part and parcel for the every student for fulfilling the academic requirements. In this age students don't have much time for searching their desire information traditionally. On the contrary, library professionals try to keep pace with the information explosion so they rely on e-resources. E-resource is short term for electronic resources or electronic information resources. These are collections of information in electronic or digital format that are accessed on an electronic device such as mobile phone, laptop, computers etc. Today the availability of e-resources in a university library is becoming an imperative role. (Jogan and Hoovinbhavi, 2016). E-resources can help the library professionals as well as students and researchers through its convenient and easy

procedure of use. Hence the library professionals are trying to introduce the e- resources for its users. Students of this 21st century are very faster than before. They are connecting 24 hours with whole world by the most powerful invention Internet. People of all sectors are benefited by this even the students particularly the university students are highly benefited by internet as they can access all types of e-resources for their study purposes and research. By using e-resources students can save the time and library professionals introduce the new and effective services towards the users. In considering with this fact Dhaka University introduce the e-resources among students in 1998 under the Dhaka University Automation project funded by UNDP and UGC, Bangladesh. DUL provides online resources through contribution towards country subscription of online resources and other resources via PERI under the Bangladesh INASP-PERI consortium (BIPC) arrangement since 2007. The online journals are linked to the DUL web site (www.univdhaka.edu) and it provides very easy interface to its users. DUL provides its electronic resource services within the Dhaka University area. These services are open for all faculty members, students, researchers, officers and staffs of Dhaka University. In 2008, DUL subscribed the online journals through PERI and get over 35 publishers and over 7500 journals available which cover different subject contents. Those publishers' links are available to the DUL website. Those links helps users to access easily the desired journal articles. Every year DUL includes new publishers through consortium. (Habiba & Chowdhury, 2012) Now Dhaka University authority provides online Journal, e-book, research monograph. Day by day the number of e-resources is increasing along with e-resources services. Mention to be made that uses of e-resources are increased in the course of time with the internet revolution.

2. Objectives:

The Objectives of this study are -

1. To find out the student's interest on E-resources.
2. To study the nature of using E-resources.
3. To explain obstacles in using E-resources.
4. To determine the level of satisfaction.

3. Literature review:

Different authors have researched on ER from different perspectives. Some wants to find and analyze the benefits, purpose of uses, level of satisfaction of users, different types of browsers, using frequency rate, impact, types of resources, quality, current status of different libraries, challenges etc. But hence, there are some gaps- no one can try to find out the Satisfaction rate of Using E-resources by the students, reasons for using E- resources, factor for using E-resources and uses of gazetteers by students in using E-resources

Habiba& Chowdhury (2012) analyzed the using rate of e-resources among the students of University of Dhaka. The sample consists with 100 respondents of all types of library users. And the study found most of the students use the e-resources every day from home. Moreover they found an extreme thing that the overall satisfaction level to e-resources is varying from users to users and nearly half of the users are generally satisfied with the e-resources.

Most of us are now mainly dependent on internet which is the contribution of communication and information technology and the impact of internet that process and search information (Jogan and Hoovinbhavi, 2016). They mainly worked with the PG students and try to find out the difference of

using rate among the post graduate students and graduate students, male and female students, different language and social science students and at last the urban and rural students. Direct interview and questionnaire was distributed to almost 100 participants randomly. This study indicates the PG students are highly favorable with this types of resources in and off campus. Moreover, male students are mostly interested for using e-resources than female.

According to Hossaini (2017) the environment of today's library is continuously changing to the new generation of library with the emphasis of electronic resources. E-resources are mostly used for getting current information and easy accessibility. By this study 100% users are aware about the access of E-resources but most of them are use the e-journals for research and education purposes, next the e-books and other sources like e-papers. The majority of the user uses the ER in most days that indicates a good sign for future. They mainly use the resources for saving their times, money and for comfort. The main advantage is for distance users with limited time to access the library since they are now able to access information outside the library (Zahariadis and Voliotis, 2003). Licensing, IPR, maintain proper standard, budget, technological obsolesce, skill manpower, lack of infrastructure are some obstacles for accessing e-resources find out by Hossani (2017).

Awareness is one of the most important factor which effects mostly on the using of e-resources. Shing and Gautam (2004) highly focus on the access of information by electronic media which should not have any value of availability if there is no accessibility. To observe the attitude of using e-resources among undergraduate students it revealed that the percentage of using e-resources among the first year students is highly lower than the final year students only for less awareness. 81% fresher are totally unaware about this type of resources. Lack of awareness must be the major reason behind the less access to EIR (Dehigama & Dharmarathne, 2015).

Tripathi and Kumar (2014) used a statistical technique for finding out the uses of electronic resources at Jawaharlal Nehru University. They established a need of library consortium to share resources and subscription fee and indicate that the popularity of e-resources are gaining gradually in academic libraries. Sharing of resources emerged gradually among libraries to overcome the decline of resources and grants (Tripathi and Kumar, 2014)

Swain (2010) reported that most of the students are aware to so many types of electronic resources and majority of the students prefer to use the e-journals by using Google.

Electronic resources are the resources that are generated through some electronic medium and made available to a wide range of viewers both on side and off side via some electronic transferring machine or internet (Saye, 2001).

Ahmed, Zabed (2013), identifies that most of the faculty members are not satisfied with the present status of the e-resources which are subscribed by their universities. He took 8 public universities of Bangladesh as sample and he got 517 responses from them. An online questionnaire survey was provided via email to the respondents. This study reveals that the e-resources are used in a wide range by the faculty members. But some constrains like poor IT infrastructure, limited title, limited back issues, unable to access from home, limited number of computer, slow internet make the e-resources unpopular to the faculty members and they lost their willingness to download the resources.

Natarajan (2017) has shown in his study that students are using electronic resources daily for their learning and research and 85.8% students use the ER daily though 74.3% students were reported that they can't find out the relevant information or documents all time. Moreover, he also observed that female students are less interested to use the ER than the male students.

Aforementioned review of the literature shows that there are enormous and different literatures on electronic resources and its services in all over the world. In Bangladesh there are some literature regarding electronic resources. Habiba & Chowdhury (2012), Ahmed, Zabed (2013), Hossaini (2017) are all of them. But still there are no work on present status and trends of electronic resources and services at University of Dhaka in the digital Bangladesh era. This study will try to focus on present status on use of electronic resources, services and obstacles in the way of using electronic resources at University of Dhaka.

4. Research model:

For getting a better responses and a fair result we have created a research model which was really helpful for collecting the data and analyzing them. After all, the full research is done by following the steps of the research model.

- ✓ Creating a questionnaire and piloting them.
- ✓ Collecting the data from the sample.
- ✓ Taking the interview of some of them.
- ✓ Gathering the data and analyzing them.

5. Study population and sample:

There are 37018 students in 83 department are in the University of Dhaka. It's really hard to find out one student without a smartphone or a laptop. They are continuously using the e-resources for various purposes. Their choices are different and their satisfactory rates are also not equal. We choose 280 students from different faculties randomly as sample. We tried to reach all the departments of the University. The questionnaire was created by a Google Form and distributed by various Social Medias and internet.

6. Data collection and analysis:

Some of the questions of the survey questionnaire were not mandatory that's why some participants were avoiding the noncompulsory questions where they don't want to share their opinion. For protecting their identity the name, department were not taken. Based on their educational level data were collected and most important thing is that no evening students were taken for the survey as sample. Almost 1000 students were individually invited for this survey where we got 280 responses from different departments and different levels.

6.1 Demographics:

Educational Background: This level is divided into two sectors one is for level of education and other is that the faculty of students.

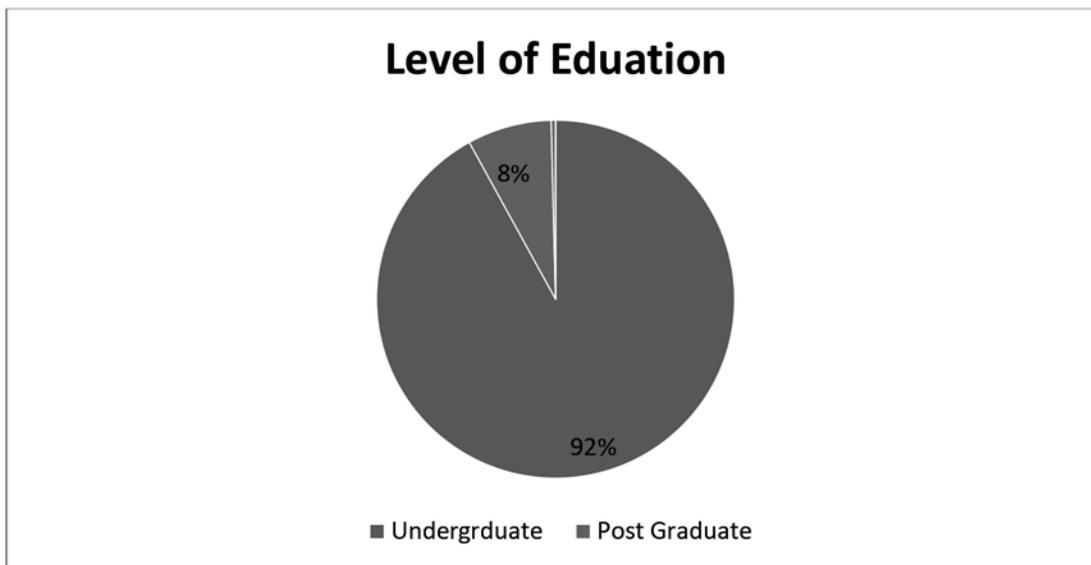


Figure 1: Level of education

We have got 280 responses for educational background which is recorded in the Figure 1. It is categorized into three parts: undergraduate, Postgraduate and the others where M.Phil and PhD were considered as the others category. Now if we look at the pie chart we can easily examine that a big portion of participants were from the undergraduate level its 92% where only 8% students are from post-graduation and there is no others category students.

6.2 Faculty of Responses:

At present the university consists 13 faculties, 83 departments, 12 Institutes and 3 residential halls, 3 hostels and more than 56 research centers. The total numbers of the students are now 37018. Presently the University enrolls more than 5,800 students, on merit basis, in the first year Honours Program in different Departments of the Faculties and the Institutes. Besides conducting teaching courses in the 4-year Bachelor and 1-year Masters Programs, the University also trains up a large number of researchers in different disciplines. More than 1262 Ph.D. and 1217 M.Phil Researchers have obtained their degrees from this University.

Faculty Name	Number of responses
Arts	154
Science	51
Business Studies	40
Social Science	35
Total	280

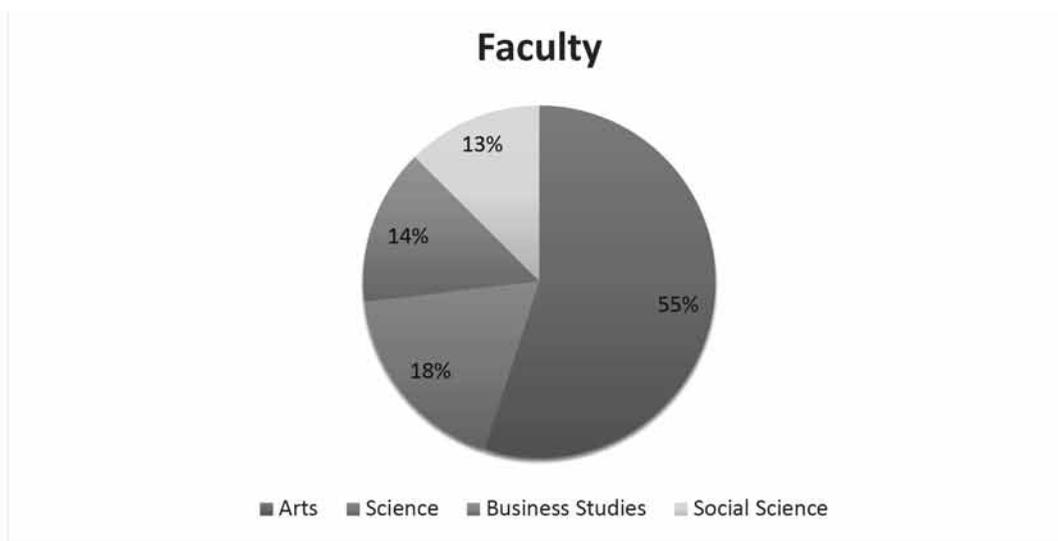


Figure 2: Educational Background

We have categorized these responses according to their faculties. Major data were collected from Faculty of Arts the percentage of the respondents is 55 where 18% students are from Science, 14% are from Business Studies and the rest 13% are from Social Science. We took the responses from 280 participants which are shown on the table.

6.3 Reasons for using E- resources by students:

The students of the university don't pass their study time only for academic study. They also pass their time for job purposes, fictions nonfictions etc.

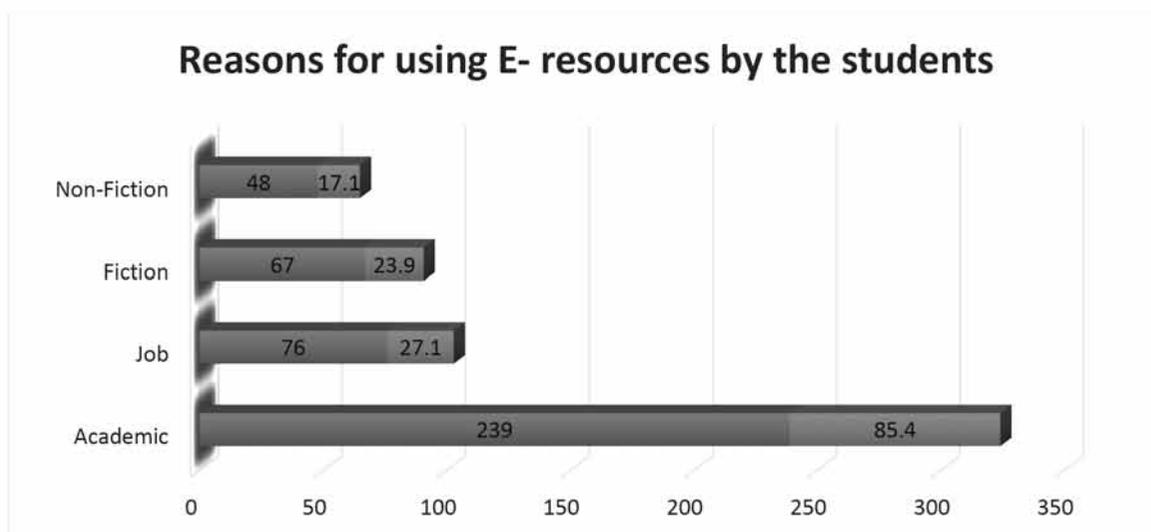


Figure 3: Reasons for using E- resources by the students

The above bar chart shows that the maximum responses were came from academic purposes i.e. 239 students than 76 students mentioned that most of the times they study for their job purposes, 67 are for fictions and rest 48 are for nonfictions.

6.4 Gazetteers uses by the students:

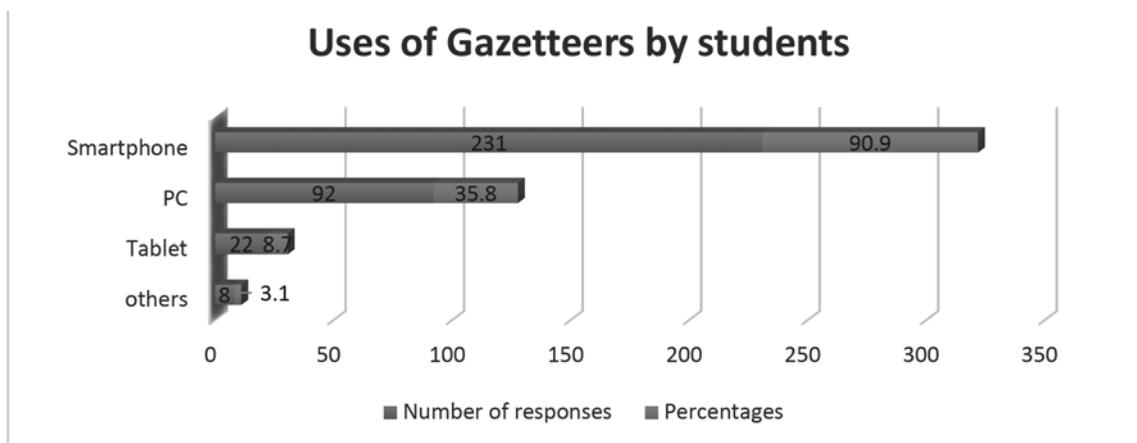


Figure 4: Uses of Gazetteers by the students

This bar graph shows the use of gazetteer among the students of University of Dhaka. Most of the students of this university prefer to use the smartphone and its rate is 90.9%. 92 students told that their most preferable gazetteer is the laptop or desktop PC and its percentage is 35.8 and 8.7% use Tablet and only 3.1% use the other gazetteers.

6.5 Types of e-resources use:

Our destination was not only identify the gazetteer and the purposes of the study we also try to find out the types of using e-resources that means what types of e-resources are they use generally was also a matter of identifying.

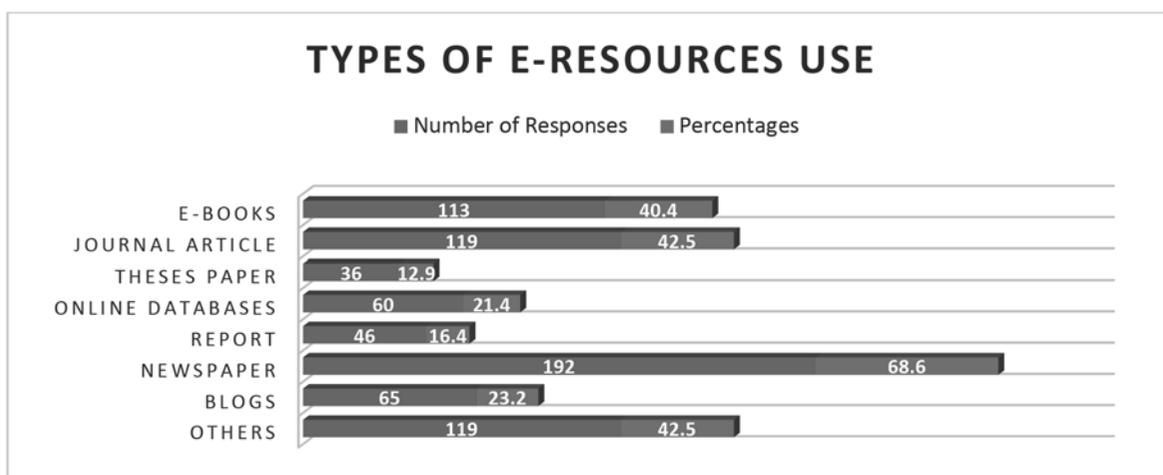


Figure 5: Types of E-resources use

Here shows the different types of e-resources where we can easily define most of the times the newspaper is used and its percentages is 68.6 where journal article and others sources are similar in percentages that is 42.5%. E-books are used by 40.4 % students and got the 113 responses. 36 % response that they use the theses paper and it is 12.9%. 21.4% students use the online databases where 23.2% use the blog sites and 16.4% use the reports.

6.6 Satisfaction rate of Using E-resources by the students:

Responses	Number of participants
Yes	199
No	39
Service need to be improved	42
Total	280

Satisfaction rate of Using E-resources

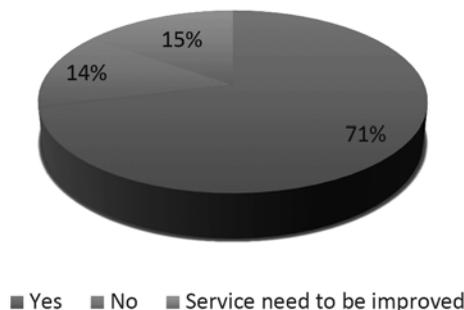


Figure 7: Satisfaction Rate of Using E-resources

The sample students were asked about their satisfaction of using e-resources where 199 (71%) students responses that they are satisfy with e-resources where 39 (14%) students are not satisfy with the e-resources. The other 42 (15%) students are thinking the present situation of the e-resources of DUL should be improved.

7. Findings:

In this present study we want to discuss about two questions. One is for the satisfaction rate of using e-resources among the students of University of Dhaka and other is that why they satisfied or why they not. From the Figure 7 we can easily conceived that most of the students are highly satisfied for using the e-resources for various purposes especially for their study.

Form our study there are 8 factors which are working here for growing the satisfactory rate. These factors are classified into some categories. The same types of responses are taken under the same category.

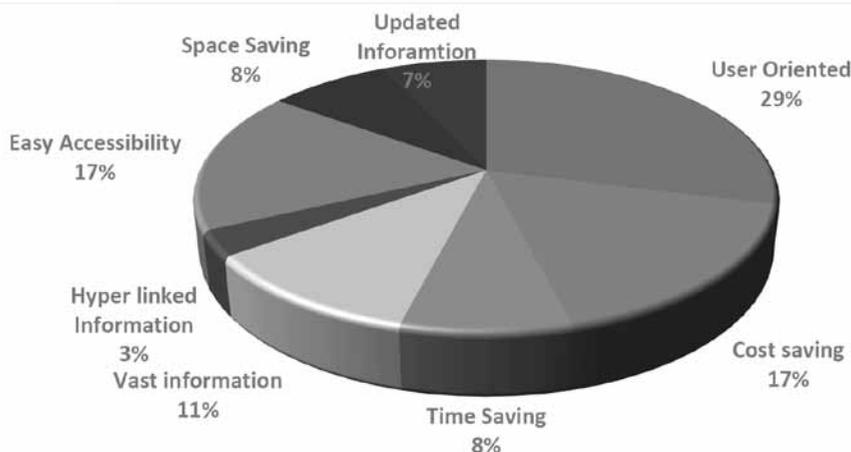


Figure 8: Factors for Using E-resources

Online accessibility is another issue for students which made an impact on using the e-resources. Within the Dhaka University campus students can use and download all the e-resources from DUL. There is another option for the non-residential students which called the Off-Campus Access. But the students are not aware about using the E-resources even they don't have any user id and password as they have the chances to get that easily. Here 55.4% students responses that they have the Dhaka University Library Online access and they can easily get their required information from there. But the 44.6% students don't have the online access of Dhaka University Library and they are really remaining behind of this facility.

Responses	Number of the participants	Percentages
Yes	155	55.4%
No	125	44.6%

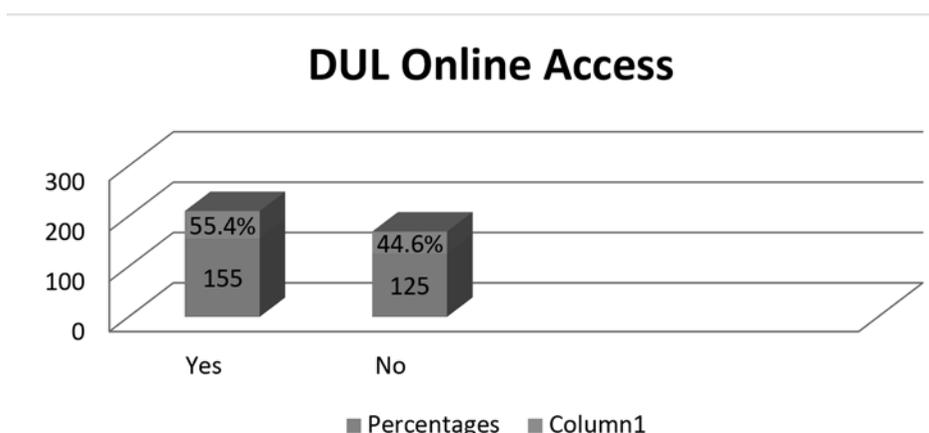


Figure 9: DUL online access

8. Obstacles in the way of using E-resources in DUL:

We have asked the students about the obstacles which they are facing in using the E-Resources. According to their responses we have found some basic obstacles and some information those are discussed below-

- **E-resources are not smart phone friendly:**

Most of the students are accessing the e-resources by their smart phones. But Dhaka University Library Website is not a responsive website that means its fonts and features are changed when they visit the website and search the e-resources through their smart phones. 15% of the students claim that they do not feel comfort to use the website on their smart phone and they lost their interest on using the e-resources.

- **Resources are used only for passing in the exam:**

Most of the students only search and use e-resources for taking preparation for their exam and for preparing assignments. They usually download the necessary resources and get lecture sheets from their teachers as they don't want to take extra pressure for searching and using other resources from the library. 50% of the students have said that they think it's a burden and time consuming work for them to go to the library and/or search e-resources from the library as they

get all the materials from their teachers.

- **Lack of information literacy:**

Most of the participants don't have any idea about the prominent e-resource providers such as HINARI, AGORA, and Web of science, Scopus, Science Direct and other databases. Actually they don't know how to use those properly for their academic purposes. 25% students are aware of provided e-resources by the library but they don't have any practical idea about the resources.

- **Inadequate e-resources in the library:**

10% of the students have said the e-resources don't fill up their actual query. There are the inadequacy of the information and the resources. There is also the dissimilarity of the resources according to their class lecture and the syllabus. Also, the limited amounts of e-resources are unable to fulfill the diversified needs of the users.

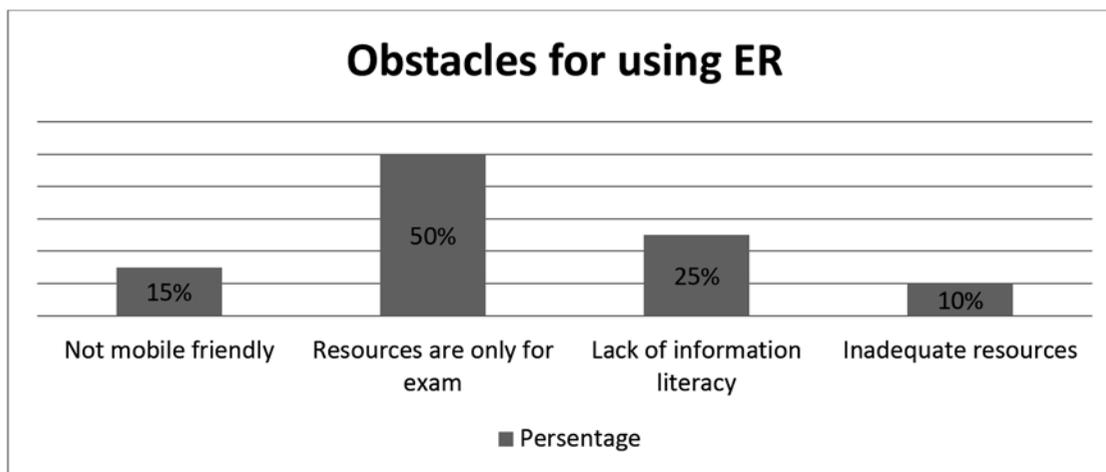


Figure 10: Obstacles for Using E-resources

9. Recommendation for accelerating the usage of e-resources:

9.1 Emphasis on information Literacy:

According to this study, the students don't have proper information literacy. They have lack of knowledge about the library services, total collections and different kinds of e-resources. Sometimes, though the students can manage to get access to the resources, they have no idea whether the document is relevant to their query or not, whether the journals are peer reviewed or not. They don't have adequate knowledge about bibliography and citation. So, first of all information literacy should be developed among the students. The library authority can take steps to increase the information literacy rate among the users of Dhaka University library. When a student becomes fully information literate, he could easily know how to use those e-resources easily.

9.2 Need Library orientation:

Every year the Dhaka University library arranges an orientation program for the fresher students of each and every department. It is happened only one time of the whole university life of a student. On that visit, the library authority provides an overview of the whole library system, its services and the collection. But it's natural that the new students have enough capability to understand the whole process of a

library as it is not so easy. On the other side, the requirements of departments are different from one another. Hence library orientation program should be arranged faculty wise or department wise in a regular basis and brief the students in accordance with their requirements.

9.3 Need to introduce library centric curriculum and the course work:

The curriculum and the study system of the University of Dhaka is not library centric. Most of the students have the intension to get all the necessary materials form their teachers so that they can spend their time on job or career related study. If the teachers would become concerned on this matter and force the students to do the library works regularly, the students would use the library resources and then they would have the adequate knowledge on the e-resources and their usage.

9.4 All students must have user ID and password for using e-resources

There is a system on this university that the remote users of the library must have a user ID and password to use the resources of the library. The library administrative section provides this user Id and password for free. But most of the students don't care about this. So there should be a policy that all the students must have used the user id and the password which will help them for growing the interest on e-resources.

9.5 Organize seminar on e-resources

Organizing seminars and the workshops on using e-resources is one of the effective methods to enhance the interest on the e-resources. The library authority and the teachers can arrange the seminars for the students and faculty members on using the e-resources of the library in a regular basis. If the students are being fully aware that they can easily access to the resources which will help them in future for their study and research. Moreover the library authority can arrange the seminar on the specific topics on SCOPUS, web of science,

Science Direct, AGORA, HINARI, Citation, Bibliography, and different E-journals and so on.

10. Conclusion:

The numbers of publications are being published in a different form in the digital age so it is very difficult for the library professionals to collect the all published materials for their libraries. In this digital age electronic resources are very important for the students to fulfill their desired information requirements in a convenient way. In the one side Electronics Resources help the librarian to keep peace with the information explosion and increased information requirement of the users, on other hand by using E-resources a user can easily retrieve his/her resources with a single click. It saves the time of the reader and minimizes cost of the library authority. If a librarian finds out the obstacles stand in the way of using e-resources, the satisfactory rate of using e-resources will be increased.

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Improving Library Services to the Persons with Disabilities: Role of ICT in Libraries

Sounak Banu

MLISC Student, Dept. of Lib.& Inf. Science, Netaji Subhas Open University

***Abstract:** This study surveyed the facilities and services available for inclusive and equitable quality education in India. The study highlighted that for inclusive and equitable quality education for people with disability, access to information is important; and since the library plays a key role in providing this access, there is need to develop policies and put structures in place to cater for students with special needs. Based on the findings, the investigators came up with a model for Inclusive access to information for students with special needs.*

***Keywords:** Special Needs; Digitization; Sustainable Development; Inclusive Education; ICT.*

1. Introduction

Inclusive education is essential for sustainable development. Every educated citizen is an asset to every community and the society at large, and helps ensure sustainable peace and development. In a democratic country like ours every child has the right to education, the right to receive help in learning to the limits of his Capacity, whether that capacity be small or great. It is consistent with a democratic philosophy that all children be given equal opportunity to learn whether they are average, bright, dull, retarded, blind, deaf, crippled, delinquent, emotionally disturbed or otherwise limited or deviant in their capacities to learn. Equality of opportunity denotes two things — equality of access to School education and equality of success in school. Inclusive and equitable quality education is important for sustainable development. UNESCO (2009) stated that inclusive education is concerned with all learners with focus on those who have traditionally been excluded from educational opportunities - such as learners with special needs and disability and children from ethnic minorities. In every classroom there are some children who have some learning problems. They need a little extra help from teachers to learn. Sometimes teachers understand their problems while at other times they are not able to understand their problems. The help they provide may not be sufficient. Their learning problems may persist and even accumulate despite special help by teachers. If teachers cannot understand the special needs of such children they will experience failure and frustration and later drop out from the school. In fact our failure to understand the special needs of such children have been major factors for our failure to reach the target of universalization of elementary education within the stipulated period. These children with special needs are called exceptional. Sustainable development goals are transformative changes needed to cater for the immediate needs of the present generation without causing harm to the future generation in terms of meeting their own needs.

2. The specific objectives of the study are to:

- ✓ Examine the facilities available for inclusive information access in libraries in India;
- ✓ Examine the critical problems faced by students with disability in accessing information, and problems faced by institutions in providing the required services;
- ✓ Identify the strategies/model to enhance information access for equitable education for students with special needs.

3. Role of ICT

Information Technology has both facilitated and inhabited access to information. Glimpses to some initiatives taken by various libraries for different able person are :

- ❖ Crete University Library of Greece installed one accessible workstation for visually impaired people and motor- impaired users, scanner ,screen readers, screen enlargement and a Braille embosser in the Library;
- ❖ The Gateshead Library of UK specially introduced MISSISSIPPI i.e. Multimedia Information System Specially Integrated Solutions with Sensory Impaired People Included to provide services to the deaf people through telemetric facilities.
- ❖ Tata Memorial Library of TISS provides separate unit for the Visually Impaired students where 10 dedicated computers with 'JAWS' pro talking software and installed 'Galileo Reading System'. They also facilitate the independent reading text facilities by providing 'text reading machine' running with K1000 OCR reading software. In this system, any printed text will be converted into sound and magnify the text for low vision on a Standard TV/Monitor. It also provides support for reading, writing, and studying for dyslexic they can simply borrow any book from the library and read the same independently .
- ❖ The Patras University Library established of two workstations with general and specialized equipment like Braille printers , scanner , Camera and microphone , speech synthesis software which supports THE Greek language ,OCR ect.

4. Problems Faced by Challenged Students in Accessing Information

Historically, education for persons with disability has gone through a number of landmarks as indicated in the global development of special education. There are many problems facing the implementation of inclusive access to information. such as inclusive education suffers from collective indifference, lack of resources and the challenge of consistency, especially in impoverished communities. Although, the increased use of ICT in everyday life and the development of adaptive hardware and software have allowed individuals with disability to do things that were difficult or impossible to do in the past, they still face challenges such as difficulty in accessing information for their academic studies. Main challenges are :

- ✓ Very low competence of students with disability in using modern technology;
- ✓ Absence of infrastructure that provides students with disability with the necessary facilities according to the individual's disability;
- ✓ Librarians low competencies in helping students with disability;
- ✓ Absence of student's free and convenient access to libraries and other premises.

5. How to Train Staff

Accessibility to the library should be a clearly defined management responsibility. A designated employee should act as liaison person with disability groups and support organizations. It is, however, important that all staff be knowledgeable about various types of disabilities and how to best assist the patron. Staff should also communicate directly with the patron and not through a caregiver. Examples of appropriate staff training include:

- Invite persons with disabilities to staff meetings to talk about their needs as library users
- Distribute e-mails and/or other information to staff on a regular basis about library services to specific disability groups
- Include information about services to special user groups in orientation/orientation package for new staff

6. Special services to Person with disabilities

- Home delivery service to persons who are not able to come to the library
- Outreach services to persons in institutions and care facilities
- Reading service for person with reading difficulties (e.g., short texts, letters, instructions, articles on tape or CD) or scanning texts to make them accessible on a computer with screen reader
- Regularly scheduled consultations for persons with reading disabilities

7. How to provide information to person with disabilities

The library should offer guided tours of the library for both individuals and groups of persons with special needs. Many of these person may have difficulties reading information about the library. Information about access, services, materials, and programs should therefore be available in the

alternative formats listed below:

For visually impaired persons

- Information in large print
- Information on audio tape, CD/DVD, or in DAISY format
- Information in Braille
- Information on the library's accessible website

For deaf or hearing impaired persons

- Information in subtitled and/or sign language videos
- Information via text telephones and/or email
- Information on the library's accessible website (audio information should also be available as text)
- Easy-to-read text for patrons who were born deaf or became deaf before acquiring language skills

For persons with reading difficulties (persons with dyslexia or weak readers)

- Information written in an easy-to-read text
- Information on audio/video tape, CD/DVD, or in Daisy format
- Information on the library's accessible website

For persons with physical disabilities

- Information on audio/video tape or on CD/DVD or in DAISY format
- Information on accessible website

For cognitively disabled persons

- Information in an easy-to-read format
- Information on audio/video tape, CD/DVD, or in DAISY format
- Information on the library's accessible website

Conclusion

Access to information is necessary for inclusive and equitable education. Education is a vital necessity for everyone, as it enables each person to become capable enough to make contributions to society. Disability does not prevent people from being hardworking and productive. All that is needed is the enabling environment, including assistive technologies. Right to Education Act 2009 ensures education to all children irrespective of their caste, religion, ability, and so on. It is essential to build an inclusive society through an inclusive approach. In doing so, we have challenged commonly held beliefs and developed a new set of core assumptions.

“Governments everywhere can no longer overlook the hundreds of millions of people with disabilities who are denied access to health , rehabilitation , support, education and employment – and never get the chance to shine .”

- Stephen Hawking

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A Study on the Prospect of Green Library in Water and Energy Conservation

Sohini Sengupta

Librarian, S.A.Jaipuria College, 10 Raja Nabakrishna Street, Kolkata-700005

e-mail:sohini01feb@gmail.com

***Abstract:** The article discusses about the new form of a library-Green library, which is gaining popularity among the library professionals. This paper highlights mainly on the water and energy conservation of a library. It also discusses the crisis of the groundwater throughout the world, need of energy conservation and suggests some measures for water conservation and energy conservation in library.*

***Keyword:** Green Library; Sustainable Library; Water conservation; Energy conservation,*

1. Introduction

With the advancement of technology, the protection of environment is needed for sustainable development. The life styles of human being are changing rapidly. To keep pace with the changing society the information professionals and the resources need to reach to the demand within a fraction of second. The curiosity in technological innovations is in a running position to fulfil the unending demands. In this rat race we are forgetting something important which should be recognized before anything else- and that is our environment, without which our existence is nowhere. Climate change, scarcity of water, repeated incident of wildfire in different parts of the world are making an alarming sign for the environment around us. To overcome this situation many researches and developmental works are going on throughout the world by different levels of social institutions on green practices. In this regard, it is to be mentioned here that 'going green' means to pursue knowledge and practices that can lead to more environment friendly and ecologically responsible decisions and lifestyles, which can help to protect the environment and sustain its natural resources for current and future generations. Thus through green practices we can conserve resources like water and energy. It also creates awareness about use of eco-friendly products which prevent contributions to air, water and land pollutions.

Library as a social institution cannot avoid its responsibility. As information professionals we have huge responsibility to protect our earth and make it a sustainable one. In this regard, a new kind of library emerges-i.e. 'Green Library'. The green library movement emerged in the early 1990s and it is gaining popularity in the field of library and information science professions. The Online Dictionary of Library and Information Science (ODLIS) define green library as green/sustainable libraries as a library designed to minimize negative impact on the natural environment and maximize indoor environmental quality by means of careful site selection, use of natural construction materials and bio-degradable products, conservation of resources and responsible waste disposal.

2. Objectives

The following objectives of this paper are given below

- to create awareness about green practices through green library
- to explore the way to conserve water and energy in library
- to make library modern technology savvy but at the same time offer green service to its users.
- to establish a new image of library as green library in modern world.

3. Review of related literature

For this study some literatures have been reviewed related to Green library or Sustainable library. Bhattacharya, A. (2017) describes about Green library and its utilities in modern day library service. According to him Green libraries expound the needs of a library, sustainable design and real cost savings in energy consumption. Besides that green libraries always provide pleasant environment to the user community. Purohit, S. (2016) commented that environmental changes like energy depletion and climate change will influence the type of information resources and programmes libraries will provide to their communities. Meher, P. and Parabhoi, L. (2017) depicted that green library or sustainable library is a new concept library and is gaining popularity among the library professionals. It also described some leading university libraries in India taking initiatives towards successful green library.

4. Methodology

For this study how library can contribute in green practices through water and energy conservation has been focused. For this, some cost effective methods which can be accommodated with the functioning of library have been taken into consideration.

5. Green Standards

There are some green standards or certificates for green buildings and other green aspects of the design. Among them the most popular is US Green Building Council which was established in 1998 for the green building rating system or standard LEED (Leadership in Energy and Environmental Design). In LEED 4 types of certifications are available on basis of certain pre-defined points. The four LEED certification level designations are Platinum, Gold, Silver and Certified. In India in 2001 Indian Green Building Council (IGBC) was established and has developed its own standards for different kind of buildings inspired by the LEED. Bureau of Energy Efficiency (BEE) was established by the Government of India under the provisions of Energy Conservation Act, 2001 to develop standards for reducing energy intensity. BEE has developed energy saving standards for buildings, lighting and electrical appliances including cooling and heating devices. BEE issues 5 star ratings on the basis of the energy efficiency of the particular products for its operation in different climatic zone. The environment ministry of Govt. of India recently started working from January 2015 on a methodology to classify green buildings on the basis of water/energy conservation methods, recycled materials, solar power, natural lightings and energy self-sufficiency. Therefore it is observed that India has started on thinking sincerely on the 'Going Green' venture.

6. Groundwater Crisis in Whole World

Throughout the world, regions that have sustainable groundwater balance are shrinking by the day. Three problems dominate groundwater use: depletion due to overdraft; waterlogging and salinization due mostly to inadequate drainage and insufficient conjunctive use; and pollution due to agricultural, industrial and other human activities. India is not also an exceptional in this situation. India is the largest user of groundwater in the world. It uses an estimated 230 cubic kilometres of groundwater per year, over a quarter of the global total. In India, water levels of some states are reaching unsustainable levels of misuse. According to World Bank report, if current trends continue, in 20 years about 60% of all India's aquifers will be in a critical condition. In that report it was also mentioned that more than 60% of irrigated agriculture and 85% of drinking water supplies are dependent on groundwater. Urban residents more and more rely on groundwater due to unreliable and insufficient municipal water supplies. Some states in India have the most severe cases of water scarcity- which include Rajasthan, Gujarat, Uttar Pradesh, Punjab, Haryana and some parts of Madhya Pradesh, Maharashtra, Karnataka and Tamil

Nadu. So, it is the high time for every citizen to be aware of this critical situation and at the same time as a social institution Library cannot avoid its responsibility.

7. Green library Initiatives in Water Conservation

- Sensible use of water in the library for its toilets can save a lot of water as well as huge money on electricity bill.
- Low flush toilets and sensor based faucets can significantly reduce water consumption in the library
- Rainwater can be conserved and treated with available rainwater harvesting technology and this way we can conserve a lot of amount of water for wash room, cleaning and gardening purposes in the library.
- The ancient easy and economical technology for rainwater harvesting can serve in the library.
- reuse of waste water in plantation within library campus

8. Need of Energy Conservation

The world's consumption of energy has increased a lot over the last few years. If the world's energy consumption continues at the current rate, many of the world's energy resources would get over as coal and crude oil take millions of years to form. Nowadays energy consumption is tremendously increased due to the excessive use of HVAC (Heating Ventilation and Air Conditioning) system. Air conditioners collectively contribute to the greenhouse effect and to global warming. The hot air releases into the atmosphere and can create more heat in the atmosphere. Thus negatively affects the environment. It can use a refrigerant that harms the ozone layer. It uses electricity, which is often produced in environmentally harmful ways such as burning fossil fuels. In this respect, Energy conservation concept comes which refers to the concept of reducing energy consumption through using less of an energy service. Due to the climate change and to reduce the adverse effect of pollution by the excessive use of fossil fuels the energy conservation is becoming necessary. It is important to conserve the energy and investigate alternative energy resources.

8.1 Green Library Initiatives in Energy Conservation

The Green Library can take the following measures for conservation of energy-

- library should have sufficient windows, glass windows and skylights which allow natural light abruptly in to it
- installation of solar panel on the roof top of library building and generate electricity for library by using direct sunlight
- the surplus energy can be conserved and helps during summer when library needs extra energy consumption because of the use of air conditioner, fan and cooler
- turning off lights during bright daylight
- turning off fans and computers when not in use
- use of CFL lights instead of tube lights
- use of maximum natural light and wind can save electricity
- using network printers instead of personal computers
- installing a new server and running multiple servers on one server box
- re-fill toner cartridges instead of buying new
- putting computers in sleep mode when not in use
- segment the lighting circuits so that one switch doesn't turn on so many lights
- eliminate the decorative lighting and reduce the halogen lights.
- Improve the building HVAC system to improve the inconsistency of heating and cooling
- Use of eco-friendly paints on the wall to reflect more light

- Laptops use less electricity than desktop versions
- Create sustainability awards as incentive to encourage library services

9. Conclusions

Environment friendly and sustainable library and information system is a biggest challenge to the library professional at this moment. Everyone concerns about the environmental issues and the library professionals will make them to think it once again, whenever they visit the environment friendly library. Their visit to an eco-friendly library will help them to practice the green habits in their daily life also. Though building up a green library is not an easy task in India, because economic challenges are always attached with it. However we have to change our mindset to make a habit of green practice in our everyday life, otherwise it will certainly not be reflected through our action.

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Collection Selection in Libraries pertaining to Sustainable Tourism

Shiv Shakti Ghosh

SRF, Department of Library & Information Science
Jadavpur University, Kolkata- 70032
email: ghoshshiv@gmail.com

Dr. Sunil Kumar Chatterjee

Professor, Department of Library & Information Science
Jadavpur University, Kolkata- 70032
email: ghoshshiv@gmail.com

***Abstract :** This paper intends to bring to the notice of librarians all such areas surrounding which literature selection may be done in libraries to build a collection to promote sustainable tourism. The United Nations Sustainable Development Goals were studied. Concepts related to sustainable tourism was jotted down. These concepts were grouped according to similarity. In this way a list of concepts related to sustainable tourism was formed. It is envisaged that if libraries build collections focusing on these topics, it will aid sustainable tourism.*

***Keywords:** sustainable libraries; collection development; sustainable tourism*

1. Introduction: Libraries cannot become truly sustainable unless their professional outreach is extended to sustainable development of other avenues. Being a social as well as a public organization it is their duty to serve the public for a greater united society. One such domain namely the tourism domain has been chosen for demonstrating the outreach of sustainable library practices. India derives its sustainable tourism practices from the dicta of ‘Bharath Darshan’ and ‘Atithi Devo Bhavah’. While travelling, besides keeping in mind about the quality of life one needs to be guided by the ethics of taking from the environment and leaving behind things in a manner that would sustain the destination for future travelers. Components of accommodation, tour operators, providers of tourist services, tour outfitters are part of the supply chain who must balance bio-diversity conservation (i.e. without sacrificing natural and cultural heritage) with the quality of visitor experiences. Sustainable service agreements should be brought forward which must be facilitated by the government. Many regions and countries depend on tourism for revenue generation. Thus, this domain is a focus of economic activities. The World Tourism Organization (UNWTO) (2017) has stated that “the business volume of tourism equals or even surpasses that of oil exports, food products or automobiles”. It has impact on educational, cultural and social sectors. This domain is experiencing an exponential increase in information and knowledge handling. Thus, there exists a plethora of areas where libraries must focus on. Collection selection must be done in such a way that sustainable tourism can be supported. In this paper all such areas has been listed so that libraries can refer to build their collection.

2. Methodology: The United Nations Sustainable Development Goals were studied. Simultaneously, concepts related to sustainable tourism were also listed. These concepts were grouped according to similarity. Controlled vocabularies namely, WordNet (<https://wordnet.princeton.edu/>), Schema.org (<https://schema.org/Thing>) and the INSPIRE (<https://inspire.ec.europa.eu/>) knowledge base were consulted for choosing the concepts so that interoperability can be enhanced. In this way a list of concepts related to sustainable tourism was developed.

3. Findings: The study revealed the concepts surrounding which collection may be selected by libraries to support sustainable tourism. The concepts along with example areas have been listed here.

Economic Viability & Quality: Collection should focus on those literatures which can help a tourist destination in focusing on maintaining its viability and competitiveness. Example areas include policy against commercial exploitation, profit generation etc.

Local Wellbeing & Control: In this area literature collection should focus on local styles, skills and materials for new construction, community participation and development etc.

Social Equity & Cultural Richness: Collection focused on local customs, explanations of appropriate behavior while visiting natural areas, living cultures and cultural heritage sites, historical and archaeological artifacts, local area's history, and culture (including food and drink, crafts, performance arts, agricultural products), spiritually important properties and sites, natural phenomena etc.

Tourist Satisfaction: Under this topic collection should focus on safe and satisfying experience for tourists, availability of facility to all without discrimination of any kind. Example areas include behavioral intentions, feedback generation tools etc.

Biological Diversity: For collection development on this topic literatures focused on rainwater harvesting, greenhouse gas emission reduction, wastewater reduction, harmful substance control,

noise pollution reduction, endangered species of flora and fauna, biodiversity conservation, rehabilitation etc. may be selected.

Physical Integrity: Collection focused on Quality of landscapes, Environment degradation, Heritage site protection etc. must be built.

Resource Efficiency: Focus should be on scarce and non-renewable resources usage reduction and usages of all kind of resources in an efficient way. Example areas include relevant national legislation and regulations for accommodation units, environment management related training manuals, land usage, heritage area requirements.

4. Conclusion: The collection selection of libraries must be done in such an order so that it can support "...management of all resources in such a way that economic, social and aesthetic needs can be fulfilled while maintaining cultural integrity, essential ecological processes, biological diversity and life support systems" (UNWTO,2005) The key concerns which were taken into consideration while listing the areas were carrying capacity, anthropogenic impacts, sensitization initiatives, environment, community participation, guidelines and principles of different governments, case studies, institutional certification. It is envisaged that if libraries build their collection focusing on these topics they will be able to support sustainable tourism.

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LIFI Enabled Smart Library System: a Futuristic Approach

SoumenMondal

M.Phil Student & Project Assistant
Department of Library and Information Science, Jadavpur University
E- Mail:soumenmondal4321@gmail.com

Ditu Bhungia

M.Phil Student
Department of Library and Information Science, Jadavpur University
E- Mail:d.bhungia1992@gmail.com

Dr. Subrna Kumar Das

Professor & Head
Department of Library and Information Science, Jadavpur University
E- mail:skd_ju2002@yahoo.co.in

Abstract: *This paper has been written to find out the feasibility and applications of LI-Fi (light fidelity) technology in digital library system. Li-Fi is a new way of wireless communication that uses LED lights to transmit data. Li-Fi serves as an alternative to Wi-Fi in term of less expensive and more traffic handling capacity. It is a new technique of transferring secured data using lights. In this article, author's tried show how a smart library system is designed based on high speed, secured, eco-friendly data transmission using LiFi.*

Keywords: *LiFi; WiF; LED; Data Transmission; Visible Light; Smart Library and Digital Library.*

1. Introduction:

Li-Fi technology has the possibility to change how we access the Internet. The basic ideology behind this technology is that the data can be transferred through LED light by varying light intensities faster than the human eyes can perceive. The idea of Li-Fi was introduced for the first time by a German physicist Harald Hass in the TED (Technology, Entertainment, Design) Global talk on Visible Light Communication (VLC) in July 2011, by referring to it as “data through illumination”.

The Li-Fi is a wireless communication system in which light is used as a carrier signal instead of traditional radio frequency as in Wi-Fi. Light Fidelity (Li-Fi) is the latest 5G technology in wireless communication. It is very important technology for researchers and library users to save their time and download anything in a nanosecond through wireless communication as a form of Li-Fi. Li-Fi basically

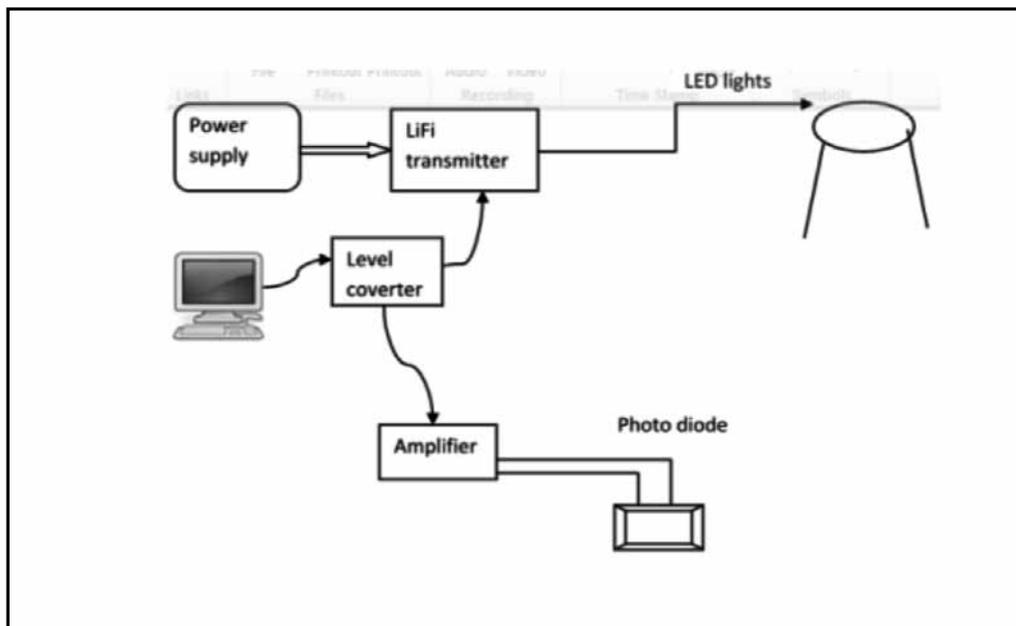
uses already available light sources like LED to transmit data, by blinking the LED. These changes in the intensity of light are detected by a photo detector device which receives the data.

2. Working principles:

Li-Fi is high speed, bidirectional, and fully networked wireless communication of data using light. Li-Fi constitutes of several light bulbs that form a wireless network.

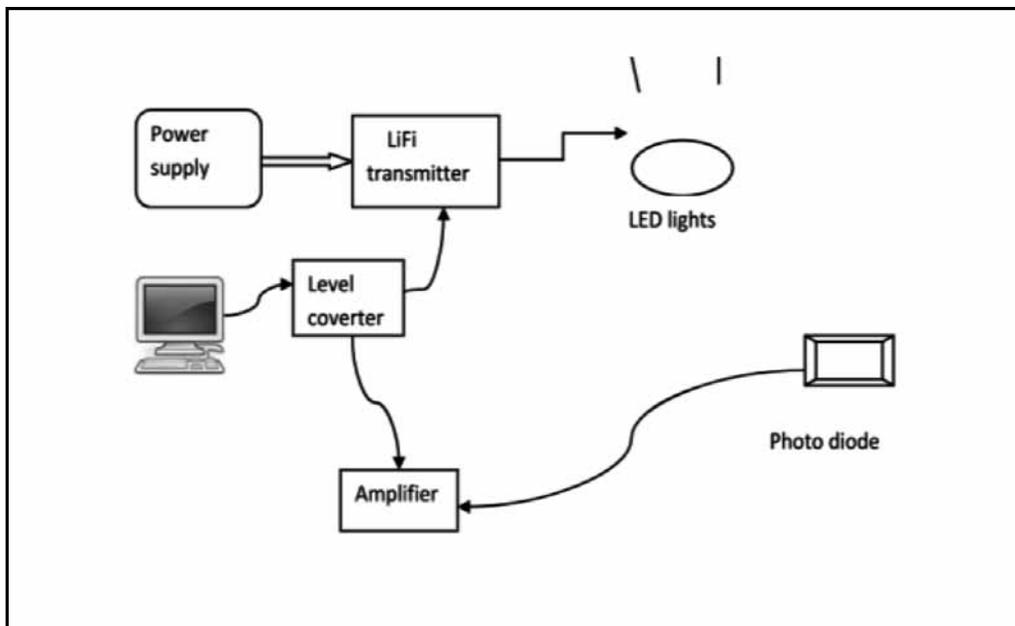
When an electrical current goes through to a LED light bulb, a stream of light (photons) emits from the lamp. LED bulbs are semiconductor devices, which means that the brightness of the light flowing through them can change at extremely high speeds. The signal is sent by modulating the light at different rates. The signal can then be received by a detector which interprets the changes in light intensity (the signal) as data. Also when the LED is ON, you transmit a digital 1, and when it is OFF, you transmit a 0.

2.1 Block Diagram for Transmitter:



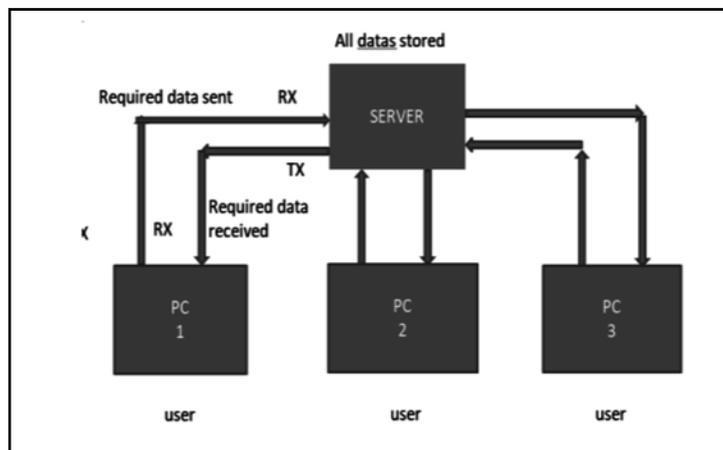
Here the user sends the required data to be fetched to the server by means of LiFi transmitter through level converter. The data is then transmitted through an LED lights to the server and the photo diode which is the receiver used to receive the data required by the user by means level converter.

2.2 Block Diagram for Receiver:



The required data sent by the user is received by the server by means of photodiode and level converter. The server reads the data required by the user and then transmits it by means of LiFi transmitter to the user by using LED lights.

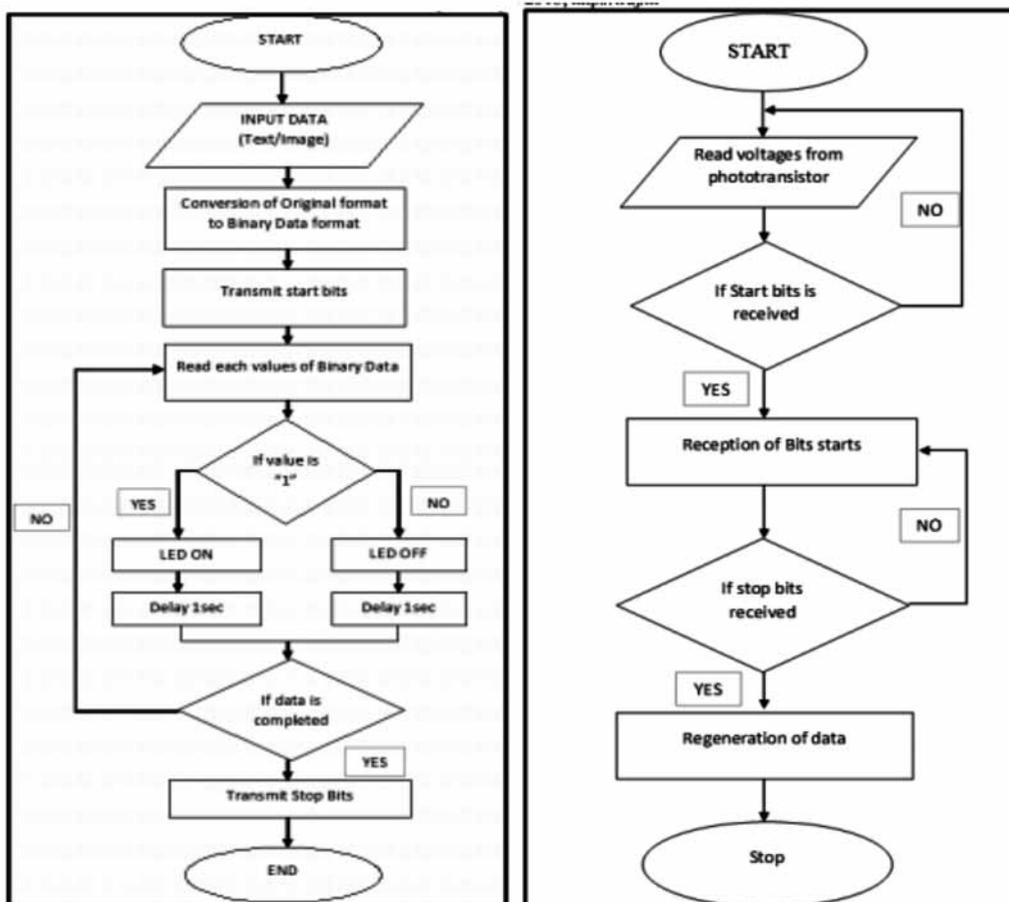
2.3 Block Diagram for Smart Library:



In this smart library system, the user sends the required data through LiFi transmitter by means of level converter. On the receiving end, the data is received by means of photodiode and sent to the source where data is to be fetched through level converter. Once the data is fetched, the data is again transmitted from the source to the receiver through Li-Fi transmitter by means of level converter. The data transmission

and receiving process is done by simulation software.

3. Flowchart for LiFi system:



4. Comparison of Wi-Fi and Li-Fi:

Parameter	Li-Fi	Wi-Fi
Spectrum Used	Visible Light	RF
Range	Range Based on Light Intensity (< 10m)	Based on Radio propagation & interference (< 300 m)
Data Transfer Rate	Very high (1 Gbps)	Low (100 Mbps-1 Gbps)
Power consumption	Low	High
Cost	low	High
Bandwidth	unlimited	Limited

5. Advantages of Li-Fi:

- Energy consumption can be minimized with the use of LED illumination which are already available in the home, offices and Mall etc. for lighting purpose.

- Combination of low interference, high bandwidths and high-intensity output, help Li-Fi provide high data rates i.e. 1 Gbps or even beyond.
- Availability is not an issue as light sources are present everywhere. Wherever there is a light source, there can be Internet. Light bulbs are present everywhere in homes, offices, shops, malls and even planes, which can be used as a medium for the data transmission.
- Li-Fi not only requires fewer components for its working, but also uses only a negligible additional power for the data transmission.
- One main advantage of Li-Fi is security. Since light cannot pass through opaque structures, Li-Fi internet is available only to the users within a confined area and cannot be intercepted and misused, outside the area under operation

6. Limitations of Li-Fi:

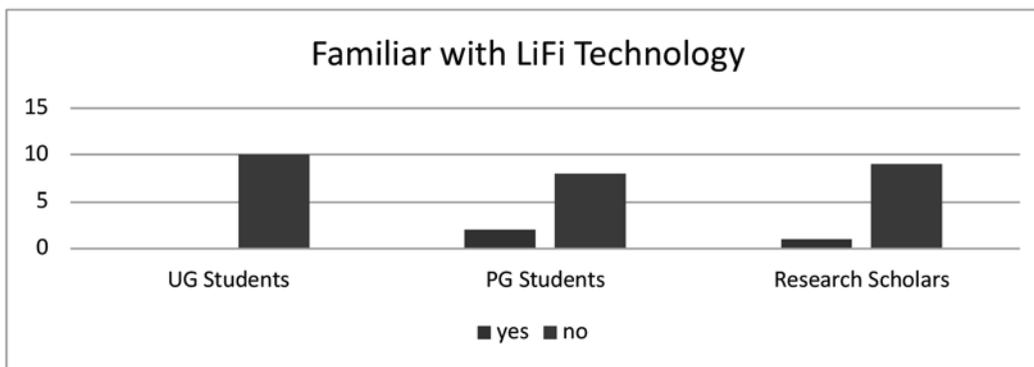
- Internet cannot be accessed without a light source. This could limit the locations and situations in which Li-Fi could be used.
- It requires a near or perfect line-of-sight to transmit data
- Opaque obstacles on pathways can affect data transmission
- Natural light, sunlight, and normal electric light can affect the data transmission speed
- Light waves don't penetrate through walls and so Li-Fi has a much shorter range than Wi-Fi
- High initial installation cost, if used to set up a full-fledged data network.

7. Application in Libraries:

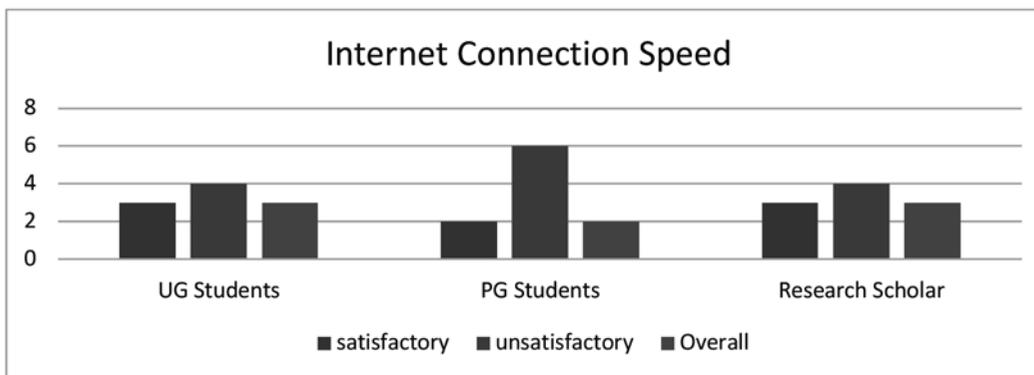
- ❖ **Analysis of User:** Li-Fi can find wide application in user analytics. Most of the libraries consist of a rich lighting environment comprising of abundant sources of light which may be utilized for Li-Fi. Li-Fi could be used to track the behavior of individual users.
- ❖ **Direction to Find Resources:** In open access system LiFi technology with the help of smart device directed user to specific location.
- ❖ **Find out Lost or Misplaced Documents:** It can also use to track some misplaced books in a library and reduced time and manpower
- ❖ **Provide Faster Internet Speed:** If we use Li-Fi technology in the libraries, then all the work will be easy and fast because the speed of Li-Fi is relatively hundred times faster than the standard Wi-Fi download speeds
- ❖ **Auto Circulation System:** Li-Fi has awesome potential in case of circulation desk. LED light bulb will able to scan particular details through binary codes instead of RFID tags. Keeping in the view of Li-Fi technology, books can be assigned with a transceiver of LI-Fi which is operated by the phone and gives all the details of the book such as price, ISBN, author name, place, publisher. The user just has to stand near the section of the book and type the book name, the book transceiver will automatically give details of the respective book.
- ❖ **Promotion of Resources:** Li-Fi can enable them to send promotions to users smart devices, displaying new arrivals and related document. Li-Fi can help to direct users from the time they enter the library. It can also help them to locate specific document in the library.

- ❖ **Text to Speech:** A text-to- speech (TTS) system converts normal language text into speech; other systems render symbolic linguistic representations like phonetic transcriptions into speech.
- ❖ **Webinar:** Li-Fi live streaming can also be beneficial for the events, Conferences, Seminars, Meetings. Li-Fi technology can be used such that instead of going into the seminar halls.
- ❖ **Augmented Reality:** Augmented Reality can also show data analytics on the device screen, without interfering with the environment and enriching the user experience. The data can be automatically processed, like trajectory, information, fire locations, average time and escape direction, and the user can interact more dynamically. Because cables restrict movement and users of mobile applications typically need to have their arms free, wireless data transfer techniques are preferably installed in AR glasses. Li-Fi technology can be used wherever connectors, cables, sliding contacts, and radio networks need to be replaced.
- ❖ **Library4.0:** LiFi, Internet of Things (IOT), and Artificial Intelligence (AI) to improve automation, communication and use of real-time data. It holds the promise of better synergy between machines and their human counterparts and will help library user better services.

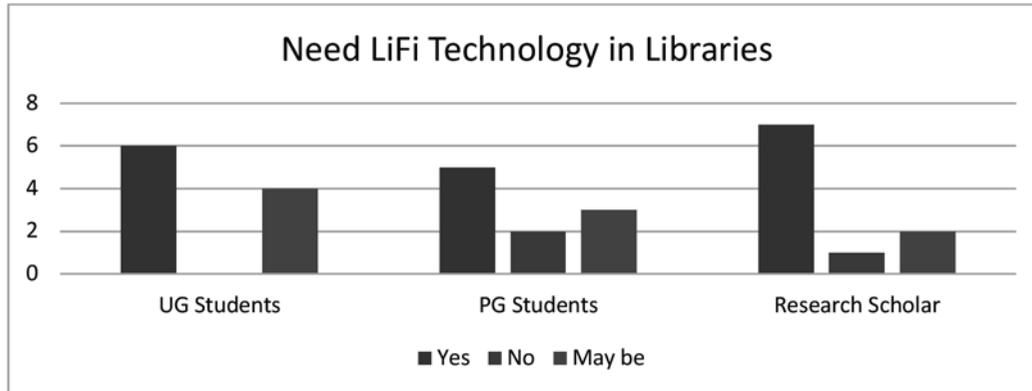
8. Users view on LiFi technology application in libraries



The above data shows the statistics of students whether have any knowledge about LiFi technology and its application t Libraries.



The above figure describes internet connection speed used by students for information searching and browsing.



The above bar diagram reflects the student's opinion about the needs of LiFi technology in Libraries for benefit of users.

9. Conclusion:

Although there's still a long way to go to make this technology success, it promises a great potential in the field of wireless internet. A significant number of researchers and companies are currently working on this concept. ERNET India has initiated Li-Fi pilot project and explore development of open source general purpose platform. By deployment of this technology, we can migrate to greener, cleaner, safer communication networks. The very concept of Li-Fi promises to solve issues such as, shortage of radio-frequency bandwidth and eliminates the disadvantages of Radio communication technologies in libraries. We have to wait to feels the Li-Fi based smart library systems.

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Exploring Problems Related to Organization of Documents on Gender Spectrum: A Case Study with the Latest Five Editions of DDC

Ankita Sanyal
Librarian at Sarojini Naidu College for Women,
M.Phil Research scholar, Dept. of Library & Inf. Science, Jadavpur University
E-mail: ankira.sanyal@gmail.com

Prof. Udayan Bhattacharya
Professor, Dept. of Library & Inf. Science, Jadavpur University
E-mail: udayanbhattacharya1967@hotmail.com

***Abstract:** In 21st century, with the advancement of Information and communication technology, Library professionals experience challenges in their day to day activity. Classifier is the person who classifies documents in the Library. Recently in 2018, in a historic verdict, the supreme court of India allowed Gay sex among consenting adults. It is also said that adult Gay sex is natural and people have no control over it. Being a professional in library and Information science the questions regarding the development of LGBT related terms in DDC always whip on mind. DDC gets enriched with new subjects only after the emergence of new literary warrant. Henceforth, the present study wants to investigate the development trend of LGBT related keywords in DDC and challenges of a Classifier in this regard.*

***Keywords:** Concept; DDC; Development; , LGBT; Literary warrant*

1. Introduction

According to the queer dictionary “The term gender spectrum is a way of describing gender without conforming to the gender binary. It denotes gender as a continuum that includes male and female, but without establishing them as absolutes or polar opposites. The view of gender as a spectrum allows for the inclusion of identities besides male and female-- specifically, it allows for the inclusion of intersex people, no binary gender identities, and no binary gender expressions”. The Indian Pinal Code (IPC) was brought in India by British in the year 1860. The section 377 was introduced in the year 1861. It is an act which criminalizes homosexuality. Before 6th September 2018, there were no legal provisions for same sex marriage. LGBT couples or singles were not allowed to adopt children. Discrimination at jobs, education, and at homes was very common. An NGO Naz Foundation started a fight in 2009 to decriminalize section 377. Section 377 of the IPC criminalizes unnatural sex between two individuals. The offence is punishable with imprisonment up to life. However, in a historic verdict, the supreme court of India allowed Gay sex among consenting adults in private in 6th September 2018. It is also said that adult Gay sex is natural and people have no control over it.

In Library and Information science, Classifier is a term which denotes a person who classifies all the

documents available in the Library. In the 21st century multidisciplinary subject approach in education is a very common thing. Most of the academic libraries are using DDC (Dewey Decimal Classification Scheme) for classifying the documents. Within the 10 main classes, 100 divisions and 1000 subdivisions concepts are arranged. DDC gets enriched with new subjects only after the emergence of new literary warrant. But in many times it has been found that various concepts are emerged but not included in the DDC. As a result, Classifiers get into problems to build class number of those documents. This research work deals with the literary warrant of LGBT concepts, growth of LGBT related terms in last twenty years and reflection of these terms in latest five editions of DDC.

2. Statement of the problem

The Problem of the proposed research focuses on the existence of the LGBT related terms in published documents and their treatments in latest five editions of DDC against literary warrant. LGBT is an acronym stands for Lesbian, Gay, Bisexual and Transgender.

To investigate the existence of the LGBT related terms, with a focus on the development of the literary warrant, the emphasis is given on the form heading present in the latest edition of DDC.

3. Objectives

Objectives of this study are:

1. To trace the existence of the LGBT related key words available in public domain in literary form.
2. To trace the existence of the LGBT related key words available in DDC.
3. To ascertain the evolution of literary warrant of LGBT related keywords in last twenty years and to analyses their position in the latest five editions of DDC.
4. To examine whether all the concepts are directly given class number in DDC or not?

5. Research questions

A set of research questions for this work are formulated as follows:

1. What are the LGBT related keywords available in different published lists and literature in social and political domain? How can they be identified?
2. Whether all these keywords are present in latest five editions of DDC or not?
3. How these keywords are arranged in DDC?
4. How the literary warrant on LGBT related terms, all over the world, have evolved in course of time? How this trend gets its reflection in DDC? What methodology should be followed in this purpose?

5. Methodology

Content analysis (Document research) and Survey of the world cat cataloguing database has been done to achieve the stated objectives of the proposed research work. In document research, at first different published lists of LGBT related keywords have been collected. By consulting all these lists, consolidated lists of terms have been prepared. Secondly, different research articles on LGBT have been collected from Emerald, Taylor and Francis, Doaj databases to find the author key words in social and political domain. By consulting author keywords of various articles on LGBT, consolidated lists of terms have been prepared. Now finally a list of terms on LGBT related keywords arranged alphabetically by consulting

above two lists. Finally 20 terms are selected by doing systematic random sampling and studying in world cat cataloguing database to see the growth of literature of these LGBT related terms over 20 years. After that reflections of these terms are studying in latest five editions of DDC. In this research work focus was given on the trend of the development of the subject because DDC gets enriched with new subjects only after the emergence of new literary warrant. World cat's advanced search option has been chosen for collecting literary warrant on LGBT related keywords. Restrictions are given on the twenty year only i.e from 2000 to 2019. Otherwise there were no restrictions on audience, content, format and language. Only specific keywords as title was given on advanced search options to achieve the result.

6. Literary warrant of Different Concepts, their interpretations and reflections in DDC 23rd edition:

Work on DDC 23rd edition began in March 2004 (DDC, 2011) and was published on 2011. This is the latest edition till date. The transition period between two published editions is very much pathetic to the Classifier. For example from 2011 to 2019 three are many concept arises which are not included within DDC 23rd edition and may be included in next edition. But within this period when a classifier classify a particular document in which concept which is not included in the latest edition, then he/she has to classify it in its broader term which may misguide a user. By consulting various documents, 116 available terms are collected which are directly or indirectly related to the LGBT concept. Within 116 terms 20 terms are founded which are directly indicate LGBT concepts. They don't possess different meanings. These terms, their interpretation and positions in DDC 23rd edition if any are given below:

6.1 Androgyne: Person appearing and/or identifying as neither man nor woman, presenting a gender either mixed or neutral. (LGBTQI terminology, n.d.). World cat database shows that there are 481 documents are available in free time span in subject approach. In DDC there are no provisions to classify a document on Androgyne in social category or under 300 social sciences.

6.2 Bisexual: A person who is sexually attracted to the same sex or different sex persons. World cat database shows that there are 12094 documents are available in free time span in subject approach. In DDC the class number of Bisexuality is 306.765.

6.3 Butch: A gender expression that fits societal definitions of masculinity. This term usually used by queer women and Trans people, particularly by lesbians. (LGBTQI Key terms, n.d.). World cat database shows that there are 1485 documents available in free time span when searching is done by treating the term Butch as a subject. In DDC there are no provisions to classify a document on Butch in social category or under 300 social sciences.

6.4 Cisgender: It refers to those people who feel comfortable with their gender identity assigned to them based on their physical structure. (LGBTQI terminology, n.d.). World cat database shows that there are 164 documents available in free time span when searching is done by treating the term Cisgender as a subject. In DDC there are no provisions to classify a document on Cisgender in social category or under 300 social sciences.

6.5 Cross dresser: A word to describe a person who dresses, at least partially, as a member of a gender other than their assigned sex; carries no implications of sexual orientation. (LGBTQI stonewall glossary of terms, n.d.). World cat database shows that there are 3024 documents are available in free time span when searching is done by treating the term Cross dresser as a subject. In DDC the class number of Cross dresser is 306.778. Here a term "Transvestism" is used to understand the class.

6.6 Drag King: A person (often a woman) who appears as a man, generally in reference to an act or performance. This has no implications regarding gender identity. (LGBTQI terminology, n.d.). World

cat database shows that there are 125 documents are available in free time span by treating the term Drag King as a subject. In DDC there are no provisions to classify a document on Drag king in social category or under 300 social sciences.

6.7 Drag queen: A person (often a man) who appears as a woman, generally in reference to an act or performance. This has no implications regarding gender identity. (LGBTQI terminology, n.d.). World cat database shows that there are 370 documents are available in free time span by treating the term Drag Queen as a subject. In DDC there are no provisions to classify a document on DragQueen in social category or under 300 social sciences.

6.8 Dyke: The term dyke (or dike) is a slang noun meaning lesbian; it is also slang adjective describing things associated with lesbianism. (LGBTQI terminology, n.d.)World cat database shows that there are 10267 documents are available in free time span by treating the term Dyke as a subject. In DDC there are no provisions to classify a document on Dyke in social category or under 300 social sciences.

6.9 Femme: It is a lesbian identity used to distinguish bisexual women and feminine lesbian from their butch lesbian partner. (LGBTQI terminology, n.d.). World cat database shows that there are 64051 documents are available in free time span by treating the term Femme as a subject. In DDC there are no provisions to classify a document on Femme in social category or under 300 social sciences.

6.10 Gay: The term Gay refers to the male person who is sexually attracted to the male person. World cat database shows that there are 130616 documents are available in free time span by treating the term Gay as a subject. The class number of Gay is 306.766.

6.11 Gender queer: Gender queer is a person who is beyond the gender. Gender queer is neither male nor female. (Genderqueer, n.d.). World cat database shows that there are 189 documents are available in free time span by treating the term Gender queer as a subject. In DDC there are no provisions to classify a document on Gender queer in social category or under 300 social sciences.

6.12 Heterosexual: It refers to the sexual attraction between persons of the opposite gender/sex. World cat database shows that there are 3668 documents are available in free time span by treating the term Heterosexual as a subject. The class number of heterosexual is 306.764.

6.13 Homosexual: The word homosexual refers to the sexual orientation between same sexes. World cat database shows that there are 5343 documents are available in free time span by treating the term Homosexual as a subject. The class number of Homosexual is 306.766.

6.14 Lesbian: The term Lesbian refers to the female person who is sexually attracted to the female person. World cat database shows that there are 30949 documents are available in free time span by treating the term Lesbian as a subject. The class number of Lesbian is 306.766 3.

6.15 Metro sexual: First used in 1994 by British journalist Mark Simpson, who coined the term to refer to an urban, heterosexual male with a strong aesthetic sense who spends a great deal of time and money on his appearance and lifestyle. (LGBTQI terminology, n.d.). World cat database shows that there are 93 documents are available in free time span by treating the term Metrosexual as a subject. In DDC there are no provisions to classify a document on Metrosexual in social category or under 300 social sciences.

6.16 Pansexual: It refers to the person who is sexually attracted to any person irrespective of his/her gender. (LGBTQI Key words, n.d.). World cat database shows that there are 32 documents are available in free time span by treating the term Pansexual as a subject. In DDC there are no provisions to classify a document on Pan sexual in social category or under 300 social sciences.

6.17 Polyamory: It is the practice of doing intimate relationship with more than one partner, with the consent of more partners involved. (LGBTQI terminology, n.d.). World cat database shows that there are 386 documents are available in free time span by treating the term Polyamory as a subject. In DDC there are no provisions to classify a document on Polyamory in social category or under 300 social sciences.

6.18 Queer: It is an umbrella term which encompasses sexual and gender minorities who are neither heterosexual nor cisgender. Lesbians, gays, bisexuals, Trans people, intersex persons are includes in this term. (LGBTQI Key words, n.d.). World cat database shows that there are 23748 documents are available in free time span by treating the term Queer as a subject. In DDC there are no provisions to classify a document on Queer in social category or under 300 social sciences.

6.19 Transgender: These people have a gender identity which differs from their sex assigned at birth. Their sexual orientation does not depend on their gender identity. (LGBTQI terminology, n.d.). World cat database shows that there are 23267 documents are available in free time span by treating the term Transgender as a subject. The class number of Transgender is 306.768.

6.20 Two spirit people: They are neither male nor female. They have attributed of both the genders. (LGBTQI Key words, n.d.). World cat database shows that there are 268 documents are available in free time span by treating the term two spirit people as a subject. In DDC there are no provisions to classify a document on Two spirit People in social category or under 300 social sciences.

Following table shows the literary warrant of selected 20 terms over last twenty years:

Table 1: Literary warrant of terms in last 20 years

Selected Terms	Documents in World cat between 2000-2004	Documents in World cat between 2005-2009	Documents in World cat between 2010-2014	Documents in World cat between 2015-2019
Androgyne	25	81	117	118
Bisexual	974	1443	2842	3368
Butch	185	211	404	180
Cisgender	0	2	22	136
Cross dresser	842	285	273	213
Drag King	28	23	38	20
Drag Queen	44	29	51	124
Dyke	859	1217	2388	1109
Femme	8231	8355	6803	4493
Gay	11739	16161	26321	26875
Gender queer	0	13	44	126
Heterosexual	475	762	940	944
Homosexual	819	794	1004	930
Lesbian	3370	4708	6343	6977
Metrosexual	3	29	32	23
Pansexual	0	1	9	19
Polyamory	49	46	93	184
Queer	1695	3282	6381	8743
Transgender	806	1844	5443	11369
Two spirit people	19	43	32	47

From the table 1 it has been established that there are literary warrant present against these terms. There are number of documents present in the subject approach of these terms. For the term Cisgender, Gender queer and pansexual no documents was present before 2005. These concepts are emerged from 2005.

Table: 2 Comparison of class number in DDC 19th, 20th, 21st, 22nd & 23rd edition

Selected Terms	Class number in DDC 19 th edition in social science 300	Class number in DDC 20 th edition in social science 300	Class number in DDC 21 st edition in social science 300	Class number in DDC 22 nd edition in social science 300	Class number in DDC 23 rd edition in social science 300
Androgyne	-	-	-	-	-
Bisexual	306.76	306.765	306.765	306.765	306.765
Butch	-	-	-	-	-
Cisgender	-	-	-	-	-
Cross dresser	-	306.768	-	306.778	306.7
Drag King	-	-	-	-	-
Drag Queen	-	-	-	-	-
Dyke	-	-	-	-	-
Femme	-	-	-	-	-
Gay	-	306.766	306.766 2	306.766 2	306.766
Gender queer	-	-	-	-	-
Heterosexual	-	306.764	306.764	306.764	306.764
Homosexual	306.76	306.766	306.766	306.766	306.766
Lesbian	-	306.766 3	306.766 3	306.766 3	306.766 3
Metrosexual	-	-	-	-	-
Pansexual	-	-	-	-	-
Polyamory	-	-	-	-	-
Queer	-	-	-	-	-
Transgender	-	-	-	306.768	306.766 3
Two spirit people	-	-	-	-	-

DDC 19th edition was published on 1979, DDC 20th edition was published on 1989, DDC 21st edition was published in 1996, 22nd edition was published in 2003 and DDC 23rd edition was in 2011. Table 2 shows the development of terms over the year. Table 2 shows that the term “Cross dresser”, “Gay”, “Heterosexual”, “Lesbian” is arise from DDC 20th edition. Upto DDC 19th edition, there was no provisions to include these terms. The term Transgender is evolved first in DDC 22nd edition.

7. Conclusion

At the end of the study it can be concluded that there are lots of concept present in the universe with the concept of LGBT. The acronym LGBT also enlarged as LGBTQI. Queer and Intersex are attached now with LGBT. Next editions of DDC also will get enriched by adding different terms which are not present in the latest editions. But classifiers will get some trouble during this period.

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Analysis of Public and Private University Library Websites of Eastern Zone of India: A Comparative Study

Chaitali Ghosh

M Phil Student, Dept. of Library and Information Science, Jadavpur University
Email: chaitali.ghosh89@gmail.com

Arindam Sarkar

Ph. D. Research Scholar, Dept. of Library and Information Science, Jadavpur University
Email: infoarindam83@gmail.com

Arijit Das

Ph. D. Research Scholar, Dept. of Library and Information Science, Jadavpur University
Email: arijitdas.lis.rs@jadavpuruniversity.in

***Abstract:** This paper tries to analyze and compare the content and usability of public and private universities library websites of eastern zone of India. Nowadays the websites of libraries are performing an important role in accumulating and circulating information and nowadays it is a popular way to interact with users without physical appearance. A study on the library websites will help us to determine and analyze the content available, so that the rich and appropriate information may be provided to us by the assessment of improving the current site. A checklist was arranged to collect data which consist of a general information about library services, information about library collection, accessibility on universities webpage, link searches and retrieve interface. This study attempted to show a comparative study by content analysis of websites of the university libraries to find out the present trends of web based library services.*

***Keywords:** Library services, Content analysis, University libraries, Library websites*

1. Introduction

India though one of the developing countries in the world in the field of education. Though India has raised its current literacy rates from previous few years. Literacy in India is a key for socio-economic progress, and the Indian literacy rate has grown to 79.31% (according to 2011 census). India's higher education system is the third largest in the world, next to the United States and China (Literacy in India, 2020). The main governing body at the tertiary level is the University Grants Commission, which enforces its standards, advises the government, and helps coordinate between the center and the state. Accreditation for higher learning is overseen by 15 autonomous institutions established by the University Grants Commission (UGC). The institutional framework of higher education in India consists of Universities and Colleges. As of 2016, India has 799 universities, with a break up of 49 central universities, 402 state

universities, 124 deemed universities, and 334 private universities (Universities in India, 2020). Libraries and information centers are the vital part of the world's systems of education and information storage and retrieval. All kinds of people including students, teachers, business executives, government officials, scholars, and scientists use library resources for their purposes. With libraries shifting their role from being custodians of collection-based traditional information resources to being providers of access-based digital information resources, the library websites plays an important role. Libraries have to disseminate and facilitate access to variety of information to their users' through their websites. The basic purpose of this study is to analyze the contents of public and private universities library websites of Eastern India.

2. Literature review

Prakash B. (2013) in his study, he analyzed the content available in Central University Libraries Websites in India. It mainly focuses on the information available in the library websites, features of the library websites, online library services, links to other information sources, value added services and so on (Prakash, 2013). Vasishta (2013) analyzed the websites of technical university libraries to ascertain that libraries are effectively utilizing their respective websites to provide trouble-free access to electronic journals available in the library. The study reveals that technical university libraries are trying to set up useful websites but the library websites of most of the institutes seem to be at primitive stage (Vasishta, 2013). Shukla and Tripathi (2010) made a comparative study of 20 central universities and 19 institutes of national importance including Indian Institutes of Technology (IITs) and Indian Institutes of Management (IIMs) academic libraries from India using a a method to measure Overall Website Performance Calculation (OWPC) and Criteria-wise Website Perf (Shukla & Tripathi, 2010).

3. Objectives:

The objectives of the study as follows:

- ✓ To know how many universities having direct link to their library websites on parent webpage.
- ✓ To identify the appropriate URL extension of central universities.
- ✓ To know the general information available in library website of selected universities.
- ✓ To know the information about library collection.
- ✓ To know the non-book material and e-resources provided by universities library websites.

4. Scope and limitation

To conduct this study the universities were selected from the India Education portal's (<https://www.indiaeducation.net/>) university list (rank wise). This ranking is one of the most well accepted ranking systems of the higher education institutions across the globe and trusted by academicians, university administrators, students, industry and governments. The present study was conducted on the selected universities library websites of Eastern India. This study was restricted within the field of internet for searching the related websites on university Libraries. The detailed list of the selected Universities is presented in the following table (Table-1).

Table 1: List of selected Universities

SL	Name of University	URL	Name of the State
1	University of Calcutta (CU)	https://www.caluniv.ac.in/	Kolkata, WB
2	Maharaja Bir Bikram University (MBBU)	http://www.mbbuniversity.ac.in/	Agartala, Tripura
3	Gauhati University (GU)	https://www.gauhati.ac.in/	Guwahati, Assam
4	Jadavpur University (JU)	http://www.jaduniv.edu.in/	Kolkata, WB
5	Patna University (PU)	https://www.patnauniversity.ac.in/	Patna, Bihar
6	KIIT University, Bhubaneswar (KIIT)	https://kiit.ac.in/	Bhubaneswar, Odisha
7	Sikkim Manipal University (SMU)	https://smu.edu.in/smu.html	Gangtok, Sikkim
8	Techno India University (TIU)	https://www.technoindiauniversity.ac.in/	Kolkata, WB
9	Assam Don Bosco University (ADBU)	https://www.dbuniversity.ac.in/	Guwahati, Assam
10	Birla Institute of Technology (BIT, Mesra)	https://www.bitmesra.ac.in/	Ranchi, Jharkhand

5. Methodology

The data have been collected through observation from the selected universities library websites of the Eastern India. In order to analysis and evaluate a checklist was designed for data collection. These checklists were used for the evaluation of the selected websites of selected universities library. The study tries to evaluate the content of these universities websites with the purpose to study the information available on library websites, services, and facilities provided on websites.

6. Data analysis and findings

In this analysis part, following table i.e. Table-2 shows the General Information available in library website of selected universities.

Table 2: General Information available in library website of selected universities

Features	CU	MBBU	GU	JU	PU	KIIT	SMU	TIU	ADBU	BIT
About info	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
About library	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Mission	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Working/Holiday	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Membership	Y	Y	Y	Y	N	N	Y	Y	N	N
Library rules	Y	Y	N	Y	N	Y	N	N	Y	N
Copyright	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Library staff	N	N	N	N	N	N	N	N	N	N
Site map	Y	Y	N	N	N	N	N	N	N	N
Date of updation	N	Y	N	N	Y	N	N	N	N	Y
Search box	N	N	N	Y	Y	N	N	N	N	Y

Above table reveals that the 100% Universities library websites provided information about their

Institution, about library, copyright their working hour about their mission. But other features like membership, their library rule, about their staff, site map, date of updation, quick search box not provided by all library websites.

Table 3: Information about library collection

Library Collection	CU	MBBU	GU	JU	PU	KIIT	SMU	TIU	ADBU	BIT
Book	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Journals	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Reference service	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Thesis	Y	Y	Y	Y	Y	N	N	N	N	Y
Reports	Y	Y	Y	Y	Y	Y	Y	N	Y	Y
News papers	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Govt. Publications	Y	Y	Y	Y	Y	N	N	N	N	N

Table 3 shows the library collections of selected university websites and the study reveals that 100% of university libraries having collection of books, journal, reports, news papers whereas KIIT, SMU, TIU, ADBU and BIT doesn't have thesis and only public universities have their own government publications.

Table 4: Information about library services

Library Services	CU	MBBU	GU	JU	PU	KIIT	SMU	TIU	ADBU	BIT
Web OPAC	Y	Y	Y	Y	Y	N	N	N	N	N
Digital library	Y	N	N	Y	N	N	N	N	N	N
E-mail service	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Photocopying	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Plagiarism check	Y	Y	Y	Y	Y	N	N	N	N	N
Database access	Y	Y	Y	Y	Y	N	N	N	N	N
CAS	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Table 4 provides the information of library services on their websites of selected universities in Eastern India. This table reveals that out of ten selected websites only University of Calcutta and Jadavpur University provides all above mentioned services.

Table 5: Availability of non book material and E-resource

Availability of	CU	MBBU	GU	JU	PU	KIIT	SMU	TIU	ADBU	BIT
E-book	Y	Y	Y	Y	Y	Y	Y	N	Y	Y
E- journal	Y	Y	Y	Y	Y	Y	Y	N	Y	Y
E-database	Y	Y	N	Y	N	Y	N	N	N	N
Links to other sites	Y	Y	Y	Y	Y	Y	N	Y	N	N

Table 5 depicts the non book material available on university websites which is so much fruitful for universities student/users. The above table shows that most of the libraries subscribe e-books, e-journal and provides some links for users to communicate with other databases or sites.

7. Conclusion

The library is the heart of university and the materials those are found in it is very fruitful for their users, and library websites provided the information to the user without physical appearance of user in library this save the time of user. This research shows the overview of content available on selected websites of eastern zone of Indian public and private universities. Most of the universities websites having all services which are help full for users to fulfil their query, but public library websites holds more advantageous position than private universities from the point of e-resource services. It is also observed that the university library websites are the good medium to know what are available in library or not without going in library if material doesn't exist in any form how can university take it as loan from other university.

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Library and Information Services of Dhibar Community of Namkhana Block, in the District of 24 Pgs (S) West Bengal

Rekha Mandal

Librarian, Fakir Chand College
Email: rekhamandal76@gmail.com

***Abstract:** In present day information becomes a necessary element of development of our society. This study will depict a picture about the different aspect of Library and information services of Dhibar Community in Namkhana Block are mainly non user formal information systems. The overall development of Dhibar Community is possible only when the Library and Information services should be reached to disadvantaged populations. This study will also highlight the different socio-cultural, economic condition, educational development of the Dhibar Community.*

***Keywords:** Information services; Dhibar Community; Namkhana Block; Library Services.*

1. Introduction

Today information becomes a necessary element of development of our society. The study of Information services of user community aims to assess the effectiveness of a library in meeting the services of the users. It also helps in planning to change or alter or extend library services for provision of improved library services to community.

The overall development of any Community is possible only when the information should be reached to such disadvantaged population. In other words information helps these people for their social development or to improve their living standards in all respect. But the nature of getting the information by this community people is a matter of concern in assessing the supply of information to these population. What should be the real need and how such need can be mingled with the type may be of information supplied to the community by the primary part of investigation of a study through which the overcoming measures can be ascertained for the development of such community. So by the types of information requirement we can identify the behaviour of the people belonging to the different sectors or community in the society. At the same time the study of Information requirement behaviour of user community aims to assess the effectiveness of a Library in meeting the needs of the users. It also helps in planning to change or alter, or extend library services for provision of improved library to community.

The Library and information services of Dhibar Community in Namkhana Block of South 24 Pargana District, in Sundarban Area who are mainly non-user of formal information systems. This Community people like other persons, are also in need of information of various kinds, though the intensity of need might be lesser than other advanced communities.

2. Purpose

The purpose of this study is to highlight information need and services of Dhibar community in Namkhana Block. Life style pattern, economic condition, educational qualification, cultural involvement etc. of the Dhibar Community are to be analyzed. The Study has practical application in the development of the fishermen community. These are:

- To know the information seeking behavior of Fishermen Community of Namkhana Block.
- To know the social, political, economical, cultural, calculation information system and services existing Namkhana Block Fishermen Community.
- To identify the information use and requirement of Fishermen Community.
- To portray accurately the characteristics of fishermen.
- To depict a picture alert the life style, socio-economic condition of the Fishermen Community of Namkhana Block.
- To find out the problems of fishermen community in regard to infrastructural employment, finance including cost and also marketing.
- To suggest the modernization of the fishing with the help of most recent technology.

3. Objectives

- To identify the information requirement and services of Dhibar Community on Primary needs, education, health and welfare schemes etc.
- To identify the different information service rendered by various agencies such as Government Office, Banks, Schools, Libraries, Health Centre, Panchayet and voluntary organizations etc.
- To identify the use of Library by the Deliable Peoples.
- To find out the problems of fishermen community in regard to infrastructure, employment, finance including cost and marketing.
- To suggest the possible measures for modernization of the fishing techniques for overall development of the Community.

4. Importance of the study

The present study focuses on the library and information services of Dhibar community. This community basically belongs to a disadvantaged community and they are non-aware of the formal information system. As the information need may be ascertained through the appraisal of the community, Dr. Sarada's observation should be worth nothing "information need may be known through the appraisal of community its people and their role and characteristic features, its economic activities and occupational pattern, nature of social and cultural life and other aspects are reliable indicators from which the nature and contents of information need could be derived. The specific conditions that prevailed in a community exercise profound influence of information needs. It is a sound procedure to draw information needs from an analysis and identification of the basic futures of the community" (Sarada, 1986). It is very much difficult to ascertain the information needs of any community like Dhibar who are mostly illiterate but not isolated in nature. Still the people have the necessity of information at least for maintaining their live hood and profession. Keeping in mind the utility of information, the needs of this community are observed in this study and after ascertaining the needs of Dhibars the necessary suggestions have been

put forward to organize information service system for them. So this study will become a guideline and will encourage studies on other backward communities in respect of their information seeking habits.

5. Scope and Coverage

The scope of the study is to present information Requirement of people belonging Fisher man community locally called Dhibar inhabiting in the area of Namkhana of South 24 Parganas in Sundarban region of West Bengal. It has 39 villages and a population of over 1,82,830 (approx). There are seven (7) Grampanchayets of Namkhana Block.

This Services will cover sociocultural, economical, educational, occupational structure, health and hygiene, religions aspect of Dhibar community of Namkhana Block in Sundarban area.

6. Namkhana Block of South 24 Pargana: An overview

Namkhana is one of the gateways to the Sundarbans, the world's largest mangrove forest. It is situated in the district of 24 parganas (s) and lies 105 km to the south of Kolkata. A small town, it cab be rached via the Diamond Harbour Road and is also connected by a rail route. The Sealdha-Namkhana line of the Eastern Railway terminates here. The place was a hotbed of one of the most powerful and heroic struggles carried out in Bengl by the peasant leadership of the Comunist Party, the Tebgha movement. The Sunderban area of South 24 Parganas was excluded from the Permanent Settlement of 1793. The British rulers provided a temporary settlement, a lease holding system for the locality. Most of these leaseholders were absentee and has appointed managers and agents to arrange the collection of produce rents from tenants, all of whom were sharecropping bhagbchasis. Not surprisingly, landlord-tenant relations in a situation such as this was marked by host of forcible impositions over and above the half share rent, besides physical coercion by the landlords agents. Hence the peasants called for the sholltion of landlordism. The specific demands included reduction of the share sent to one-third of the produce, the stoppage of ad hoc impositions, fines and punishments, and the grant of receipts against rents. The element of spontaneity in the spread of the movement was particularly noticeable. Eventually, the Kakdwip Tebhaga movement (of which Namkhana was a part) ended as it filed to withstand the combined attack of the police and lathials of the landlord.

Namkhana has emerged as an important export centre for marine products. In the coastal villages of South 24 Parganas, shrimp cultivation is growing in importance, as an alternative growing in importance, as an alternative means of livelihood and semi-processed shrimp is exported from here. The largest solar power plant in India has come up at Manshuni Island in the Namkhana Block. This is a joint venture between the centre and state government. The famous tourist destinations of Bakkhali and Frazerganj can be reached from here by crossing the Hatania-Doania creek by ferry. The Sagar Islands, famous for the auspicious Gangasagar Mela, too can be reached from here.

7. Profile of Namkhana block

Area	227.14km ²
Population	182830
Male	93351
Female	89479
Sc population	47260
St population	741

Literacy	138117
Men	75314
Women	62803
% literacy	75.5
Men	80.7
Women	67.6
Primary health centre	4
Tubewel	39
Commercial bank	4
Rural bank	2
Total worker	68789
Male worker	46053
Female worker	22736
Public library	5
Yearly production of fish	5594000kg

8. Conclusion

After analyzing the studies, we can early evaluate the Dhibar Community and their role in the development of the growing civilization. So it is most important to the development of a community like fishermen to help them on economical sources, to organize self help groups for giving them ownership. Therefore the structure of society will be strong and lead to advancement.

9. The Problem faced by the Dhibar Community of Namkhana Block observed

A large number of people of Namkhana Block maintain their livelihood by fishing in rivers and deep sea. Apart from fishing, people of Namkhana Block, are involved in agriculture and various hand industries. The varieties of fish are found in Namkhana Block like Bhetki, Bhola, Tangra, Chingri, Parshe and Pin Bagdas (larva of Bagda prawn), Ilsa etc.

But the fishermen are now facing various problems to survive:

First, Most of the fishermen are illiterate. They are lacking information about modern technique of fishing. They are compelled to follow traditional way of fishing method. They also have no sufficient fund to collect modern tools for fishing become most of the fishermen are under below poverty level.

Second, though the fishermen depend out on fish, they remain unaware of any fish based industries, fish preservation and other important facts.

Third, The unavailability of fishes in local rivers is an important problems. One of the reason behind this unavailability of fishes in this area is catching eggs of other fishes, which take place unconsciously and automatically while catching Pin Bagda which in turn in imparts fish reproduction. But unfortunately

local fishermen community remains unaware of these facts.

Fourth, the adverse effects of Global Warming are found in very climatic change in this area. Due to climatic change, fishing has become very difficult for fishermen. Due to rise in average temperature fish like Ilsa is now found in deep sea. The fishermen are now compelled to go remote part of sea for fishing and often fall in danger.

Because of climatic change, eco-system of water of this area has already destroyed, many varieties of flora & fauna has disappeared. Approximately 100 varieties of fishes become already non-existence from this area.

Fifth, death of fishermen by attack of local wildlife (snakes, crocodiles) is a common phenomenon. This causes tremendous problem to the families concerned.

Sixth, due to lack of modern scientific communication of signaling system those fishermen who boat to remote sea for fishing of ten fall in danger in case of sudden effect of natural calamities.

Seventh, the leakage of diesel from engine-boats cause pollution of water of Namkhana Block. Also excessive pressure to tourist and their throwing of plastic packets, unused food and toilets make very much pollution of water of this locality. As a result different fishes are now disappearing from these rivers

Apart from those problems, the fishermen face problems due to unauthorized entrance of foreign trollers and boats in local water bodies and frequent dacoits.

10. Suggestion

First, there should be some training on modern techniques of pisciculture and fish preservation to improve the effective knowledge base of fishermen community. There should be establishment of a training institute on pisciculture in the area.

Second, the local government bodies should work sincerely to cultivate awareness among the community about different government loans, and projects to help them.

Third, a local co-operative system involving fishermen community may be organized which will help to improve the social and economic status of fishermen. The local community should have awareness regarding co-operative and related issues.

Fourth, awareness among the fishermen is required to prohibit them for fishing Pin Bagda by using small whole net.

Fifth, local eco system should be preserved properly. Unscientific fishing may cause severe damage to local eco system.

Sixth, communication and signalling system must be improved to save the fishermen who go to deep sea for fishing so that they become aware of any sudden incidents of natural calamities.

Seventh, the use of diesel engine in boat must be restricted. The entrance of excessive tourists must be controlled and they should be make awareness for prohibiting them from causing pollution of local water bodies.

Eight, Government should take programmes for funding them so that they may access modern tools for fishing.

Ninth, Government should take initiative to increase literacy programme among the fishermen

community.

Tenth, the government authorities at different levels should adequately compensate death of fishermen by attack of local wildlife. Awareness regarding insurance and related issues should be enhanced among local people to overcome this problem.

Eleventh, Security arrangements must be increased to protect the fishermen from the illegal entrance of foreign trollers and dacoity.

Twelfth, the fishermen of Namkhana Block cannot get reasonable price of due to lack of well-organized market. Government should take initiative to improve well organized market so that the fisherman of this locality may obtain reasonable price by selling their fish.

Thirteenth, sufficient cold-storage must be built to preserve the fish.

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User Satisfaction in Digital Environment in Respect of College

Tanusree Dasgupta

Student, Dept. of Library and Information Science, Jadavpur University

E-mail-tanu_dasgupta@yahoo.co.in

Abstract: *In the digital age user's satisfaction to get the information is depend upon various attributes i.e. types of users, digital knowledge of users, digital facilities, communication process, language of information, time, economy etc. Here my study is focused on the different types of user's (students, teachers, and staff) satisfaction in respect of using or getting information in digital environment. Library is the place where users and information can communicate through the help of service of librarian in an organized way. This study aims to construct a prototype for digesting the library resources and interlinking them for better information dissemination. Library orientation is more useful for open access programme.*

Keywords: *User's satisfaction; N-LIST; User Orientation; Library resources; Library services*

1. Introduction

Users in respect of information mean who uses the information from the retrieval section. When different types of users get their desired reading materials or information or e-information at required time, they become satisfied. This satisfaction depends on both side i.e. (1) User, patrons, clients, and (2) information provider or librarian.

According to Cambridge Dictionary users means "someone who uses a product, machine, or service. According to Kenneth Whittaker (1993), "a user may be defined as a person who uses one or more of a library's services at least once a year." The library user is the focal point to the 21st century library and information. According to Cambridge Dictionary Satisfaction means," a pleasant feeling that you get when you receive something you wanted, or when you have done something you wanted to do." User satisfaction has been recognized as an important measure of library performance, in general user satisfaction has been defined as the degree to which the library is able to meet the demands of the user. A library is the heart of learning community, facilitating teaching places for students, research scholars and faculty members to advance their knowledge. Networking and resource sharing among libraries should be practiced towards proper utilization of library resources and e-resources. It needs to organize user's education program in a certain interval, so that library e-resources and services can be utilized properly (Sahu, 2013).

2. Objectives

The process of designing an e-access facility coupled with a library portal was conceived with the following objectives...

- 1) To take survey based on needs and demands of resources of students of college in respect of online learning resources.
- 2) To develop suitable digital environment (digital classroom) that facilitates online information resources.
- 3) To develop algorithms to parse designated syllabus of various faculties into searchable keywords using standard library science tools such as thesaurus (Sear's list of subject heading, Library of Congress subject heading).
- 4) To identify a list of top academic institutions offering free and open resources relating to the syllabus content of the specific college. Special focus was given to the e-resources sited developed by the Government of India such as Consortium for Educational Communication, INDEST-AICTE Consortium under International Coalition of Library Consortia, e-PG Pathshala etc.
- 5) To collect the details of information resources available on World Wide Web using data mining techniques which shall be periodically accessed by the to-be developed engine.
- 6) To conduct user education programs so as to habituate digital content reading among students.

3. Methodology

To collect the primary data of present study, survey method was used. A structured questionnaire was designed randomly distributed among 120 users (teachers and students) out of which 80 (67%) filled questionnaire were received to draw the result of study. The sample of this study consisted students and teachers who regularly visited the library.

4. User's orientation

In order to encourage the students to make maximum use of library they need to be made familiar about the environment of the library. Here, the role of user orientation comes into the picture. In other words, making the students familiar with different sections, collections, services, staff, and catalogue is user orientation.

Mews (1992) has defined user education, "as instruction given to readers to help them make the best use of a library."

The user orientation is all about educating the users as to how to use the library and make maximum use of its collection and services offered by it.

The users need to be told about the following:

- Resources and services of the library
- Types of documents and their features and locations
- Organisational structure of the library
- Any special collection or service
- Information overload
- To create awareness and understanding of the basic and relevant library and information sources and services.
- To bridge the gap between the user and the collection of the library.

- To enhance the users' abilities to select the appropriate information sources and systems for given information need.
- To offer instructions in the effective and judicious use of the available collection and services.
- To develop users' knowledge and skills to access or retrieve the information required.

5. Process of Library Orientation

The library staff takes the following steps in order to orient the user towards the library:

- Explain to the new user how the library operates-the hours that the library is open, the number of items a user can borrow from the library at a time, the rules for using the library material, etc.
- Take the new users on a guided tour through the library, show them all the different sections in the library. As they go through the library, the staff explains to the users how the materials in the different sections are arranged. The users can be shown where different materials like reference books, textbooks, and newspapers are kept.
- Introduce them to main library staff who may be contacted for different queries.
- Show them the different collections e.g. books, reference materials, text books, theses and dissertations, scholarly journals, magazines and newspapers, etc.
- Explain to the user how to find information in the library by using card catalogue or OPAC.
- Tell about the different services which are offered to the users. The library orientation offers the staff an opportunity to promote their services to the users.
- Give them the library brochure, information pamphlet or other printed materials. The users will make use of the information they gained during orientation sessions.

User's Satisfaction survey table depending on the following attributes of the college named Shri Shikshayatan, Kolkata:

Table1: Frequency of Library visit of students

Frequency	Number	Percentage
Daily	200	50%
Weakly	1125	52.96%
Occasionally	60	12%

Table2: Purpose of Library visit

Purpose of Visit	Number	Percentage
Study	200	40%
Issue/Return	300	60%
Write or making Note	150	30%
Question paper written	200	40%
Photocopy	380	76%
Opac Search	50	10%
Internet Use	290	58%
Computer Use	350	70%

Table3: User satisfaction on Library Resources

Library Resources	Highly Satisfactory	Satisfactory	Don't Know	Unsatisfactory
Text books	70%	85%	0%	0%
Reference Books	55%	70%	1%	5%
CD,Audio tape, DVD	40%	45%	2%	10%
News paper	77%	80%	0%	1%
News paper Clippings	40%	40%	20%	0%
Journals	50%	70%	0%	10%
Magazines	55%	65%	0%	10%
E-journals(N-LIST)	40%	65%	10%	35%
E-books(N-LIST)	35%	55%	10%	45%

Table 4: User Satisfaction on Library Services

Library Services	Highly Satisfactory	Satisfactory	Don't Know	Unsatisfactory
Circulation	68%	89%	0%	11%
Reference	40%	55%	1%	45%
Reprography	60%	75%	0%	35%
News paper Clippings	45%	60%	2%	40%
Library Orientation	50%	68%	5%	32%
CAS/SDI	40%	50%	20%	50%
SMS Service	50%	65%	5%	35%
E-mail	20%	36%	2%	64%
Internet service	50%	70%	0%	30%

Table 5: Problem faced while accessing e-resources

Problems	Number	Percentage
Power Supply	200	40%
Slow Internet Speed	300	60%
Insufficient Time	150	30%
Lack Knowledge	100	20%
Any other	50	10%
Total	700	

Table 6: Advantage of accessing e-resources

Advantage	Number	Percentage
Easy accessibility	270	54%
Downloading facility	200	40%
Simultaneous usage	190	38%
Less time consuming in searching	200	40%
Total		

6. Suggestion

- There is a need to include more number of online journals in different disciplines
- More computer terminals should be installed in the college library and the internet speed should be improved
- Information professionals and the library staff should help the users to create awareness and use of e-resources

Conclusion

Despite the fact that these learning resources are made available free of cost to the students through Digital learning centers by the colleges and universities , the practical usage of these resources by the students of higher education is very paltry as the competencies of the students to search, locate and retrieve information online are at very rudimentary level. Thus millions of rupees spent annually by the government to make available latest educational resources so as to improve the quality of higher education in India. There is an urgent need to develop in every universities and college library such interfaces that supplemented and support classroom teaching.

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Concept of Digital Library: A Critical Study

Priyanka Roychowdhury

Project Fellow, Dept. of Library and Information Science, Jadavpur University
E-mail: roychowdhurypriya@yahoo.co.in

Saptarshi Khanra

MPhil Student and Project Fellow, Dept. Library and Information Science, Jadavpur University
E-mail: Saptarshiblis2016@gmail.com

***Abstract:** This paper analyses, interprets and evaluates the existing concepts of Digital Library as reflected /found in the published literature related to the concepts of Digital Library and the present paper expresses the author's personal opinion about the existing concept of Digital Library. The methodology for this paper includes the systematic review of the published literature related to the concepts of Digital Library and analyzing, interpreting and evaluating the core concepts of Digital Library.*

***Keywords:** Digital Library; Digital objects; Metadata; Repositories; Digitization.*

1. Introduction

The term digital library has been come from the word 'digital' which refers to a particular state in which information is embedded in some media digitally i.e. a combination of 0 and 1 and the word 'Digital' also means digit all (0 and 1 bit). So the origin of the term digital is digit. Library is a place where documents are kept in an organized manner for the use of the members of society. Digital library is a library in which digital documents are housed for the users. So the term 'digital documents' (digital documents are documents which hold human intellectual endeavor in digital form) is important for digital library. Thus, a digital library is a library in which collections are stored in digital formats i.e. 0 and 1 bit (as opposed to print, microform, or other media) and accessible by computer networks. Digital library is just a part of a library Digital library is an organized collection of digital objects or digital documents including text, images, audio and video, along with methods for access and retrieval.

Recent developments in information and communication technologies, including the web and other factors such as Information explosion, searching problem in traditional libraries, low cost of technology, complex nature of recent document, storage problem etc., environmental factor, new generation needs have revolutionized the concept of libraries leading to the development of Digital Library. Each library is slowly getting digitized. Presently many synonymous terms like "Electronic Library"; "Virtual Library", "Library without walls", "Paperless Library" is used along with the term "digital library". The first use of the term "digital library" in print may have been in a 1988 report to the Corporation for National Research Initiatives. The term "digital libraries" was first popularized by the NSF/DARPA/NASA Digital Libraries Initiative in 1994.

Digital Library is an evolution of classic traditional Library. The development is already taking place. The traditional libraries are shifting towards automated library, the automated one towards the electronic library, the electronic library to digital library and hybrid library. The historical development digital libraries are as follows:

- Vennever Bush's Memx Machine, 1945
- Licklider (1965) in his book described the research and development needed to build a truly usable digital library
- Invention of Internet 1983
- World Wide Web by Tim Berners Lee, 1989
- Digital Library Initiative I 1992-1998
- Digital Library Initiative II (1999-2002)

It is crucial to distinguish between digital library and traditional library while writing essay on digital library. The following table clearly differentiates between traditional library, digital library, electronic library and virtual library which can be shown in the following table:

It is also needful to define electronic library and virtual library in order to differentiate digital library from them. Electronic library consists of electronic materials-CD, DVD etc. and electronic services. Electronic materials can include all digital materials as well as analog formats that require electricity to use. While virtual library consists of materials from a variety of separate libraries organized in virtual space using computer & computer networks. It can be said that all electronic are digital but all digital are not electronic.

2. Concept of Digital Library

Several definitions of Digital library are available in the literature. Providing a definition of the term "digital library" is difficult. Confusion comes from the fact that "digital library" can mean different things to different people, depending on their perception of the concept. Of course, the concept of digital library has multiple senses that one might invoke in various contexts. Digital library as a concept and a reality is defined in a number of ways.

Here are a few definitions of the term that have been drawn from various sources.

- ❖ According to Arms a digital library is a managed collection of information with associated services where the information is stored in digital format and accessible over a network.
- ❖ The Digital Library Federation defines digital libraries as organizations that provide the resources, including the specialized staff, to select, structure, offer intellectual access to, interpret, distribute, preserve the integrity of, and ensure the persistence over time of collections of digital works so that they are readily available for use by a defined community or set of communities.
- ❖ American Research Library (ARL) defines a digital library as not a single entity. It requires technology link the resources of many. The links between digital libraries and their resources are transparent to users. Digital library collections are not limited to document surrogates (bibliographic records). They are the actual digital objects such as images, texts, etc.

- ❖ A digital library is “a managed environment of multimedia materials in digital form, designed for the benefit of its user population, structured to facilitate access to its contents and equipped with aids to navigation of the global network.

After critically studied the above definitions, according to me the most standard, comprehensive and simple definition of digital library is:

Digital library is a computer resident networked library, created and managed by some defined software, containing digital objects- which are not tangible to its users, but can be used seamlessly.

The following diagram clearly defines what the digital library is-



Digital library can also simply be defined as a library consisting of digital materials & services. Digital materials are items that are stored, processed & transferred via digital (binary) devices & networks. Digital services are services that are delivered digitally over computer networks.

It can also be stated that a digital library is a library in which collections are stored in digital formats (as opposed to print, microform, or other media) and accessible by computers. The digital content may be stored locally, or accessed remotely via computer networks. A digital library is a type of information retrieval system.

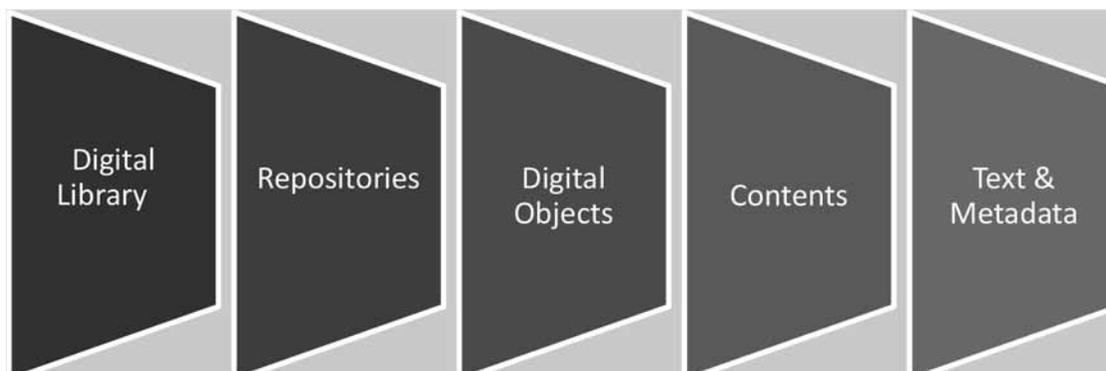
ARL Definitions-Association of Research libraries has identified the following 5 elements in various definitions of Digital libraries:

1. The digital library is not a single entity;
2. The digital library requires technology to link the resources of many;
3. The linkages between the many digital libraries and information services are transparent to the end users;
4. Universal access to digital libraries and information services is a goal;
5. Digital library collections are not limited to document surrogates: they extend to digital artifacts that cannot be represented or distributed in printed formats.

I strongly differ with the above characteristics of digital library proposed by Association of Research libraries. In my point of view, the most important elements of digital library are as follows:

- ✓ Digital objects or digital documents
- ✓ Metadata
- ✓ Software
- ✓ Repositories
- ✓ Database

The following is a simple diagram which shows the basic ingredients of Digital library:



3. Objectives

The objective of the present paper is to analyze, interpret and evaluates the existing concepts of Digital Library as found in the published literature related to the concepts of Digital Library and the present paper expresses the personal opinion of the author about the existing concepts of the Digital Library.

4. Methodology

The present paper is based on the qualitative research method. The methodology for this paper includes the systematic review of the published literature related to the concepts of Digital Library and analyzing, interpreting and evaluating the core concepts of Digital Library is reflected in the published literature and the author's own personal opinion about the existing concepts of Digital Library reflected in the published literature related to Digital Library.

5. Characteristics of Digital Library

- It may contain variety of digital information resources ranging from text, audio, image, video.
- It largely reduces the need for physical space.
- Users of digital library may be distributed all over the world.
- It provides access to various types of information resources.
- Several users can use the same information resources at the same time.
- It breaks time, space, language barrier.
- It should allow for better searching& retrieval facilities.
- It presupposes the absence of human intermediaries, & hence appropriate mechanisms should be put in place to support users with all the different levels of IT, Subject and linguistics skills.
- Digital libraries are the digital face of traditional libraries and include electronic (digital) as well as print and other (i.e. film, sound) materials.

From critically analyzing the above characteristics of digital library I agree with some points and also differ in respect of some characteristics as mentioned above which are generally found in different literatures. In my point of view, the salient characteristics of digital library may be as follows:

- It is tangible
- It is managed by software
- It is networked
- It is digitized
- In Digital library all the resources are resided in computer server
- Maximum user access

The main objective of digital library is to provide seamless access to a very large organized digital information and knowledge to users globally round the clock.

6. Components of Digital Library

Community- Library Professionals, Library Users, IT Professionals, Vendors

Communication technologies-Communication Networks-Web servers, bandwidth, LAN, Internet, Software.

Network Standards- Digital Object Identifier (DOI), http, z39.50.

Contents – Text, Images, Audio, Video, Animations, graphics, Programs, Web pages, Markup standards, metadata standards, eBooks, eJournals, online databases, full text collections.

Computer - Server, P.C. with multimedia, U.PS. Etc.

According to me Items in digital library are digital objects. They are stored in repositories and identified by handles. Information in digital library is stored in digital objects is called content, which is divided into two parts: data and information about data, known as properties or metadata.

Digital library is composed of digitally represented components (CD, DVD etc.). All the resources in Digital library do not exist physically. The resources completely exist in a computer server.

7. Advantages of Digital Library

- No physical boundary,
- Round the clock availability,
- Multiple accesses,
- Structured approach,
- Information retrieval,
- Preservation and conservation,
- Space, Networking, Cost.

In my point of view, the main advantages of digital library are that a digital library brings distributed information from all over the world to the user. Digital libraries facilitate improved access to information by providing various sophisticated search and retrieval facilities. Digital libraries provide improved facilities for information sharing among users. Digital libraries help users to get up-to-date information. Digital libraries break the barriers of time, space language and culture, thus improving the use of information. Digital libraries facilitate improved collaboration among users. Lastly it can be stated that

digital library reduces the digital divide.

8. Disadvantages of Digital Library

- The computer viruses,
- Technological obsolescence,
- Lack of standardization for digitized information,
- Quick degrading properties of digitized material,
- Different display standard of digital product,
- Copyright issues.

The main disadvantages of digital library as i am understood may be copyright issue and technological obsolescence.

From the above discussion according to my point of view while describing digital library the following attributes should be considered-

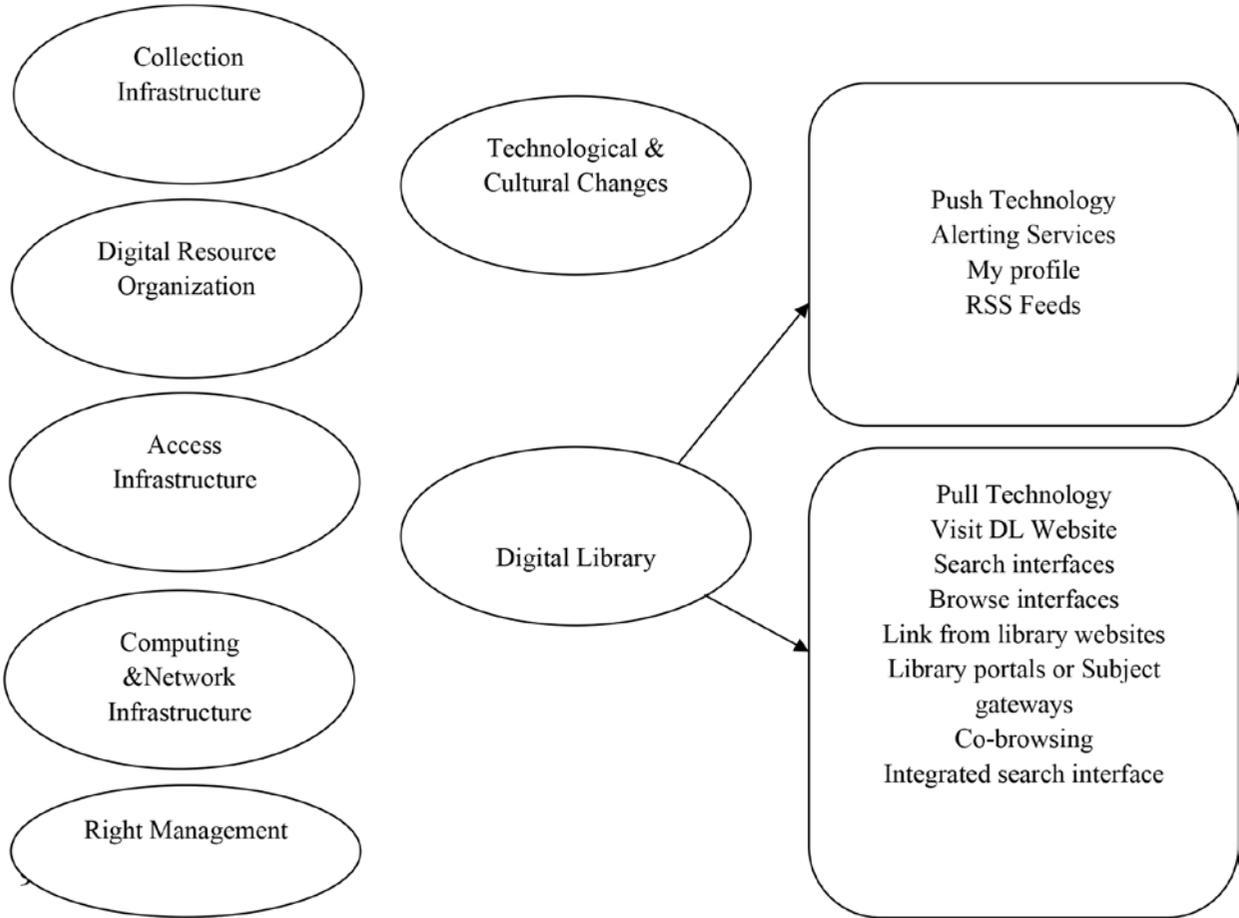
- ❖ Digital library must be created and managed by a software.
- ❖ Full text of a document, bibliographic record, user's profile, circulation of that documents must be maintained by that software.
- ❖ Digital library must be networked.
- ❖ For unclassified documents maximum user access must be ensured that is user's approach must not be denied.
- ❖ It is tangible that is it has no physical structure.

In my opinion Digital library is just a part of a library. Digital library is a library in which digital documents are housed for the users. So the term 'digital documents' (digital documents are documents which hold human intellectual endeavor in digital form) is important for digital library. Thus, a digital library is a library in which collections are stored in digital formats i.e. 0 and 1 bit (as opposed to print, microform, or other media) and accessible by computer networks. Digital library is an organized collection of digital objects or digital documents including text, images, audio and video, along with methods for access and retrieval. Every digital library should hold digital documents as their collection. Digitization is perhaps the only characteristic of a digital library on which there is universal agreement.

Digital library rests upon as I perceived:

- Basic human need for timely and relevant information
- Digital technology
- Software
- Users
- Digital objects
- Hardware
- Metadata

Digital Library: The Big Picture



9. Conclusion

Lastly it can be concluded that in most general sense that Digital library is a computer resident networked library, created and managed by some defined software, containing digital objects- which are not tangible to its users, but can be used seamlessly. Digital library is a part of a collection of a library. Digital documents or objects are the heart of digital library. Digitization is the main technology of the digital library that is collections are available in 0 and 1 bit. Digital library provides seamless access of digital information round the clock to the users globally through computer network. Digital objects, hardwares, software, repositories, metadata, computer networks are the main components of digital library. Technological obsolescence and copyright issue are the two main disadvantages of digital library. Digital library does not exist physically. It completely resides in computer server.

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Medical Records Preservation in Libraries

Dr. Sanjukta Mitra

Librarian, Rani Birla Girls' College, 38, Shakespeare Sarani. Kolkata – 700017

E-mail: sanjukta069@gmail.com

***Abstract:** Medical records are those records that depict the medical history of each patients getting treatment from a particular medical institute/hospital. All the medical institutes are now maintaining a medical record department as it helps to initiate, maintain and investigate the patient records to generate various database and management related policies. It also helps the concerned government regarding policy making decision in Health and Medical sector. The paper has tried to do a short study on the type of information available from the hospitals of Kolkata through their websites. The study resulted that all these hospitals are giving various types of medical reports on the basis of their data collection. If any users need any particular information they need to go through proper channel to retrieve it. The user groups could be both medical and non-medical professionals. It is now an essential need to preserve each and every type of information by medical records department for Research and Development work that helps the posterity to develop the medical sector.*

***Keywords:** Medical Records, Hospitals, Users*

1. Introduction

All the hospitals or medical organizations are now maintaining a department called Medical records department. These departments are taking data on each patients, whether inpatient, outpatient or emergency patient starting from

- the disease they are infected,
- no. of days they are getting treatment ,
- services received by various personnel of hospitals
- recovery rate or mortality rate, etc.

These medical records help in smooth and efficient running of any medical organization as it provides information support to doctors and other medical professionals regarding each patient. The correct documentation of patients care requires a well-designed data sheets, registers and reports all the time. Medical records are essential because

- it acts as a means of communication between doctors, nurses and other medical professionals;
- to provide an easy reference regarding patient care;
- it act as a documentary evidence regarding treatment provided to each patient;
- it serves as future reference to assist in treatment of other patients;
- it supports and protects the medical professionals and patients too in case of any litigation;
- it stands as an important document in managerial decision making processes like budgeting, etc.

1.1 Users of Medical Records

With reference to the book Medical Records : organization and management by Mogli¹, there are various types of users who have their own needs. The author mentioned the following lists summarize the important aspects of medical records to each user:

Patient

- a) Present and past state of health
- b) Analysis of present illness in terms of diagnosis and prognosis
- c) Consultation opinion
- d) Serves as reference
- e) Old records enables physicians to review and analyse previous illness
- f) Protects from legal actions
- g) Assist kith and kin in settling property litigation
- h) Obtaining blood group
- i) Obtaining medical certificates, such as birth, death insurance and so forth.

Physician

- a) Yields information about previous treatment, reactions, allergies, drugs, investigations, methods of treatment, and results of care
- b) Evaluation of drugs for their clinical effect
- c) Comparative studies
- d) Medicolegal concerns
- e) Teaching and research

Health Care Institution

- a) Evaluating the competency of the medical, nursing and ancillary staff (quality assurance)
- b) Justifying the results of treatment
- c) Medico legal purpose
- d) Defence in malpractice suits
- e) Basis for preparing operating budgets
- f) Administrative control over functional activities

Research Team

- a) Medical Science is dynamic new techniques; new methods and new medications
- b) Conduct research to meet own country's need's
- c) Medical records of present and past help in concurrent, prospective and retrospective research
- d) Control health care costs

- e) Find better drugs and techniques
- f) Improve quality of services
- g) The teaching programme
- h) Essential for medical education
- i) Medical students require lot of practical training besides theoretical classes
- j) Records are full of documented facts of live cases, which are better than a written textbook

National Health Agencies

- a) Depend on Information
- b) Allocate budget, staff and equipment
- c) Plan and construct hospitals and health centres is required locations
- d) Determine the type of health services required
- e) Monitor all hospitals and health institutions
- f) Collaborate with international organizations
- g) Develop medical and allied health service education

International Health Organizations

- a) Responsible for assisting and guiding nations
- b) Control infection diseases and epidemics
- c) Provide assistance to needy nations and accepting assistance from countries which have surpluses
- d) Exchange experts and specialists
- e) Send medical supplies and other items to needy countries
- f) Need reliable information from all countries to achieve global healthier living

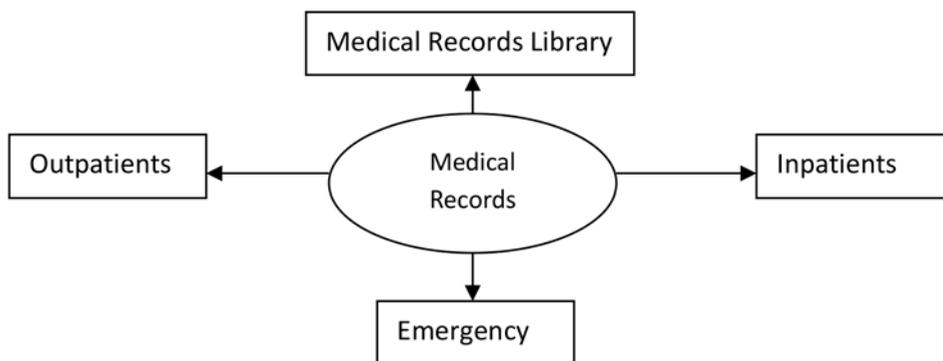
1.2 Uses of Medical Records

Mr. G D Mogli¹ also pointed out the various functioning of medical records department who are actively provide requisite information as and when required. There are different situations arises which demands these departments to serve the information promptly, like,

- a) Medical records are examined for medi – claims, required by Insurance companies;
- b) The payment of medical compensation to on duty workers/employees
- c) Cases related personal injuries
- d) Registration of birth and death of each citizen
- e) Data required for forensic or other criminal cases
- f) Public service demands issuance of various medical reports and certificates
- g) Identification of patients, etc.

Therefore, the establishment of this essential department helps to investigate records of the inpatients,

outpatients and emergency patients in all forms; to cooperate doctors, medical service providers and patients' families with all necessary developments; the department also code the records as per international classifications of diseases and operations; and the most importantly the department preserves all types of documents including X-Rays and diagnostic reports in scientific ways; to arrange the records in international format so that the retrieval of the required data could be possible at any time; and finally to work as a bridge between all the departments of the hospital and centrally manage the records for future decision making.



1. Kolkata Medical Records Department

Kolkata holds the oldest medical colleges and hospitals in the eastern Indian region. As a result, the city attracts and provides various medical services to patients from Eastern India and from other neighbouring countries too. These hospitals and colleges are holding medical records department which is a very big source of important data that helps to identify the medical crisis or development at different levels of society.

Medical College and Hospital, Kolkata (Govt of West Bengal)

The British East India Company established the Indian Medical Service (IMS) in the year 1764 to look after Europeans in British India. On 9 May, 1822 the British Government laid down a plan to fill the position of native doctors in the civil and military establishments of the Presidency of Bengal. For the said purpose and imparting the medical teaching in local language, on 21st June, 1822 they founded "The Native Medical Institution". In 1833 William Bentinck committee recommended a requirement of a medical college 'for the education of the natives'. Consequently a new medical college, known as the Medical College Kolkata was established on 28th January, 1835. Its purpose was to train native youths irrespective of caste and creed.

It is standing one of the oldest Medical College and its hospital is also provide treatments to more than thousand patients per day with all senior and junior doctors. The college has a separate medical records department which one can find from website under the category 'Citizen Charter' from the menu. Here, they post every year's annual report as follows:

Annual Report Of Medical Record Department 2018						
Month	Technical Certificate	Duplicate	L.I.C.	B.H.T. Xerox	Injury Report	Police Case
January	175	30	20	0	Nil	800
February	266	32	34	2	Nil	685
March	239	24	46	0	Nil	755
April	164	26	30	3	Nil	750
May	200	19	32	6	Nil	850
June	146	21	32	2	Nil	650
July	238	28	39	1	Nil	655
August	226	25	52	5	Nil	712
September	172	20	18	5	Nil	700
October	132	18	33	1	Nil	650
November	155	14	32	2	Nil	750
December	195	31	27	2	Nil	700
Grand Total	2,308	288	395	29	0	8,657

Apart from this report, the department enhance various research studies on Alzheimer and on Birth Weight of Newborn Babies in Kolkata. The hospital archives contain primary source documents that have accumulated over the course of last few years, and are kept to show the function of the organization. The archives consist of records that have been selected for permanent or long-term preservation on grounds of their enduring cultural, historical, or evidentiary value.

2. Conclusion

In conclusion it can be observed that Records are essential in every sector of public work and medical sector is such an area that requires constant research and development. Therefore, all the governmental and private hospitals are maintaining a separate medical records department that collects the data and archive them after analysing the information. The department helps to provide primary source for any research work the hospital is carrying out. The department also suffices the information needs of patients, administration, government, researchers and others too. The type of records the hospitals are generated is very much cleared from the table generated from the portal of Calcutta Medical College and hospital.

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Open Access Institutional Repository of Universities in West Bengal: Comparative Study

Koushik Pathak

M.Phil. Scholar, Department of library and information science, Jadavpur University
Email: koushikpathak2002@gmail.com

Biswaranjan Manna

M.Phil. Scholar, Department of library and information science, Jadavpur University
Email: manna.biswaranjan@gmail.com

Abstract: *At present we live in the age of information explosions. So we need to store all types of digital data and information by using proper database. Many institutes try to store their information in there Institutional repository with the help of information technology. This paper is to analyses the significance of use of Institutional repository in Jadavpur University and Vidyasagar University. Main objectives of comparative study of Institutional repository in Jadavpur University and Vidyasagar University. Institutional repositories are increasingly spread in academic institutions to manage a variety of digital content including educational, research, and archival materials. In Institutional repository they store many types of documents by the faculty, researcher, and students of an institution. Jadavpur University and Vidyasagar University divide 8 and 7 community in there Institutional repository and store hues amount of digital data. The standards and definitions of the Dublin Core element sets have been developed and refined by the Dublin Core Metadata Initiative with an eye to interoperability.*

Key words: *Institutional Repository, Database, Academic Institutions, Information Technology.*

1. Introduction

Institutional repository is storage of hues amount of paper less digital documents. User can access usable digital documents from this Institutional repository. Institutional repositories are partly linked to the notion of a digital library—i.e., collecting, classifying, cataloguing, preserving, and providing access to digital documents. An institutional repository is a machine readable archive of the intellectual product created by the faculty, researcher, and students of an institution. Documents are accessible to end users of institution and others. Any Institutional repository can enrich with the help of students, research scholars, teachers, scientists, administrative staff, and academic support staff. Research material, question papers, and other documents are hosted and managed on an Institutional Repository server, using appropriate IR software. All digital documents are accessible on the organizational LAN (intranet) + Internet/private network. The internet has become a most important medium for information exchange. An effective institutional repository of necessity represents collaboration among librarians, information technologies, archives and records managers, faculty, students, and university administrators. Management and dissemination of scholarly documents in digital format created by the institution and its community members, such as, technical reports, theses and dissertations, data sets, and question papers, reports etc.

Jadavpur University and Vidyasagar University use DSpace as an open source software for building institutional repository. DSpace (<http://www.dspace.org>) was developed by the MIT library and HP. DSpace is an open source institutional repository software. It captures, stores, indexes, preserves and redistributes an organization's research material formats. DSpace supports institutional repositories and electronic records management. DSpace is being used worldwide to store many digital documents.

2. Objectives

The present study made an attempt to evaluate of institutional repository in two different universities. This study is undertaken to fulfill some objectives...

- To create global visibility of digital documents for users.
- To know the types of digital resources and academic publishing are stored in Institutional Repository.
- To know the use of different metadata standards for storing digital documents in Institutional Repository.
- Types of electronic resources managed in institutional repositories and to provide open access to institutional research output by self-archiving it.
- Perception, attitudes and use of open access repositories in a humanistic area.

3. Methodology

The survey method was employed to collect the required data. Jadavpur University and Vidyasagar University have been selected as an institutional repository for this study. Collect many types of information and data from their Institutional repository or Institutional repository database, by searching their website. Case study method is also followed for this study. The data's are analyzed based on certain parameters, such as number of documents, use of metadata elements, types of communities etc.

4. Limitation of the study

For the present study I select only Jadavpur University and Vidyasagar University. In West Bengal only two universities use open access institutional repository. In this study I try to cover only open access institutional repository (DSpace) of Jadavpur University and Vidyasagar University. All data are collected from <http://jadunivdspace.jdvu.ac.in/> and <http://inet.vidyasagar.ac.in:8080/jspui/> (dated 15.07.19)

5. Institutional repository

An Institutional repository is an organization based set of services which the organization offers to the members of its community for the management and dissemination of digital materials created by the institution and its community members. It is most essentially an organizational commitment to the stewardship of these digital materials, including long-term preservation, where appropriate, as well as organization and access or distribution" (Clifford Lynch 2003)

6. Jadavpur University's institutional repository

This digital repository of Jadavpur University, India is developed to capture, organize, disseminate and preserve the research publications of JDU. It also includes the in-house technical reports and annual reports in addition to various other grey literatures created within the institute. You can search, browse and access full text of these publications from the repository. (<http://jadunivdspace.jdvu.ac.in/>)

7. Vidyasagar University's institutional repository

DSpace@VU is the Open Access Institutional Repository of Vidyasagar University. Research outputs

of VU - journal papers, conference papers, reports, theses, patents etc. - are uploaded/self-archived by VU Faculty members and researchers who do research on different specialized areas. Interested users can freely download and use documents as most of them are directly accessible and full-text downloadable. 'Request Copy' forms can be used for documents to which direct full-text download is restricted due to publisher embargo. "This repository is administrated by Central Library, Vidyasagar University". (http://inet.vidyasagar.ac.in:8080/jspui/?subject_page=1)

8. Data analysis

Data analysis is the most important part of any research work. In this paper data analysis part builds with the help of collecting data from their websites and repositories.

8.1 Name of the institutes and web address of institutional repositories

In this table indicate the webaddress of institutional repositories in West Bengal.

Table 1: Name of the institute and web address of institutional repositories

No.	Name of institute	Website
1	Jadavpur University	http://jadunivdspace.jdvu.ac.in/
2	Vidyasagar University	http://inet.vidyasagar.ac.in:8080/jspui/

Here table 1 represents the name of the two institute's one Jadavpur University and another is Vidyasagar University and given their web address of institutional repositories. We can collect institutional repository's documents data for Jadavpur University using <http://jadunivdspace.jdvu.ac.in/websites> and Vidyasagar University using <http://inet.vidyasagar.ac.in:8080/jspui/> using this websites.

8.2 Name of the communities in institutional repository

DSpace is a open source institutional repository software, all data are store under communities in DSpace. Also we can store many types of documents using sub community under community in open source institutional repository software DSpace. **Table 2: Name of the communities in institutional repository**

Sl.No	Jadavpur University	Vidyasagar University
1	Affiliated Institutions	Academic Documents
2	Central Archive	Administrative Documents
3	Centre for Studies	Convocation Addresses
4	Departments	Events @ VU
5	Institutions(courses affiliated)	Miscellaneous Documents
6	OLD & RARE COLLECTION	Old Question Paper Archive
7	Ph.D_Coursework	Vidyasagar University Periodicals Repository
8	Schools	Distance Education (e-SLM)

In Jadavpur University's institutional repository uses as a communities like Affiliated Institutions, Central Archive, Centre for Studies, Departments, Institutions (courses affiliated), OLD & RARE COLLECTION, Ph.D_Coursework, Schools etc. as a communities. On the other hand Vidyasagar University use Academic Documents, Administrative Documents, Convocation Addresses, Events

@ VU, Miscellaneous Documents, Old Question Paper Archive, Vidyasagar University Periodicals Repository and Distance Education (e-SLM) as a communities.

8.3 Numbers of question papers in different Faculty / Dept. / School / Institute

Previous years examination question papers or old question papers are the most important documents for university students.

Table 3: Question papers of different Faculty / Dept. / School / Institute

Sl. No.	Faculty / Dept. / School / Institute	JU's question papers	VU's question papers
1	Institute of Business Management	306	15
2	Smt. J. D. Birla Institute	2281	-
3	Yoga	33	-
4	Faculty of Arts	5663	324
5	Faculty of Engineering & Technology	17220	-
6	Marine Engg.& Research Institute	291	-
7	Schools	2122	-
8	Commerce	-	23
9	Faculty of Science	2751	297
10	Marine Engg.& Research Institute	291	-
11	Post Graduate Question Papers [UG and PG Distance Mode all subjects]	-	86

Table 3 represents the numbers of question papers of different Faculty / Dept. / School / Institute. In Jadavpur University's institutional repository store hues number of documents like Institute of Business Management (306), Smt. J. D. Birla Institute (2281), Yoga (33), Faculty of Arts (5665), Faculty of Engineering & Technology (17220) etc. but Vidyasagar University store there question papers like faculty of Arts (324), Commerce (23), Faculty of Science (297) and Post Graduate Question Papers [UG and PG Distance Mode all subjects] (86).

8.4 Doctoral thesis in institutional repository

Doctoral thesis is the important documents for researcher. Researcher can access doctoral thesis according to user needs, from University's institutional repository.

Table 4: Number of doctoral thesis faculty wise

Sl.No.	Faculty	JU's No. of thesis in IR	VU's No. of thesis in IR
1	Faculty of Arts	328	38
2	Faculty of Science	-	81
3	Faculty of Commerce	-	14
4	Faculty of Engineering & Technology	368	0
Total		696	133

Table 4 explain the faculty wise distribution of doctoral thesis in institutional repository. In Jadavpur

University's institutional repository's faculty wise distribution is faculty of Arts 328, faculty of Science 0, Faculty of Engineering & Technology 368, on the other hand Vidyasagar University's institutional repository's faculty wise distribution is faculty of Arts 38, faculty of Science 81 and faculty of commerce 14. But total number of doctoral thesis in Jadavpur University 696 and Vidyasagar University 133.

8.5 DC Field use for thesis metadata in institutional repository

With the help of metadata any institutional repository can store documents. Metadata can help to identification of items or records.

Table 5: DC Field use in thesis metadata

Sl. No.	D C fields in institutional repository	J U institutional repository	V U institutional repository
1	dc.contributor.advisor		
2	dc.contributor.author		
3	dc.date.submission		
4	dc.date.accessioned		
	5		
	dc.date.available		
6	dc.date.issued		
7	dc.identifier.other		
8	dc.identifier.uri		
9	dc.description		
10	dc.description.abstract		
11	dc.description.sponsorship		
12	dc.language.iso		
13	dc.publisher		
14	dc.relation.ispartofseries		
15	dc.subject		
16	dc.title		
17	dc.type		
18	dc.identifier.department		

Dublin Core is a one type of metadata schema that arose from an invitational workshop sponsored by the Online Computer Library Center in 1995. "Dublin" refers to the location of this original meeting in Dublin, Ohio, and "Core" refers to that fact Dublin Core is set of metadata elements that are basic. But here use 18 types of metadata in two institutional repositories. In Jadavpur University Institutional repository did not use dc.identifier.other, dc.description.sponsorship, dc.publisher, dc.relation.ispartofseries. But on the other hand Vidyasagar University did not use dc.date.submission, and dc.identifier.department.

8.6 DC Field use in institutional repository for question papers

Metadata is data about data. Metadata can help to find out any items or records from database.

Table 6: DC Fields use for question papers metadata

Sl. No.	D C fields in institutional repository	J U institutional repository	V U institutional repository
1	dc.contributor.author		
2	dc.date.submission		
3	dc.date.accessioned		
4	dc.date.available		
5	dc.date.issued		
6	dc.identifier.uri		
7	dc.description		
8	dc.language.iso		
9	dc.publisher		
10	dc.relation.ispartofseries		
11	dc.subject		
12	dc.title		
13	dc.type		

Table 6 shows that two Institution select different types of metadata field for submission question papers in their own Institutional repository, in jadavpur university Institutional repository did not use alltypes of metadata field like dc.contributor.author, dc.description, dc.relation.ispartofseries. On the other hand Vidyasagar University did not use dc.date.submission, dc.description, and dc.relation.ispartofseries.

9. Conclusions

In this study, suggest that the role of institutional repository in digital environment to store and dissemination of data or information. In institutional repository store many types of documents like thesis, journal article, question papers, audio lecture etc. but Jadavpur University and Vidyasagar University's Institutional repository are stored only text data, there are no images, mp3 or video files. Jadavpur University's institutional repository store 31,419 documents, on the other hand Vidyasagar University stores only 4,062 documents in his institutional repository. Jadavpur University and Vidyasagar Universitys elect open source institutiona lrepository software, Dspace to store their data. DC field use for thesis metadata in institutional repository, PhD thesis and as well as question papers. Vidyasagar University did not use dc.date.submission, and dc.identifier.department metadata but Jadavpur University used. Total number of doctoral thesis in Jadavpur University 696 and Vidyasagar University 133.

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Best practices adopted at Visva-Bharati Library: An Overview

Dr Sanat Bhattacharya

Assistant Librarian, Visva-Bharati, Santiniketan

E-mail: sanatkbh@yahoo.co.in, sanat.bhattacharyay.visva-bharati.ac.in

Abstract: *Visva-Bharati Library Network successfully metamorphosed from a traditional library to a comprehensive hybrid library with a remarkable expansion of its collection, services and infrastructure. This paper describes the practices and attitude adopted for the achievement of this success. Maximum utilisation of all printed and digital resources which are available free or procured. Planned in-house efforts have resulted in complete Library Automation including creation of databases, bar-coding of publications and implementation of Libsys Integrated Library software. The supportive strong infrastructure including the large Intranet and Internet networks are adequately utilised for user services. The Visva-Bharati Library's mission is of total User satisfaction through user-friendly access to physical as well as digital collections and services. Every year Visva-Bharati Library Network organises user education programmes for newly admitted students of the University. Visva-Bharati Library Network ensures quality of library facilities and best services to the user.*

Keywords: *Library management; collection & services; Extent of the Use of Services; Information Technology etc.*

1. Introduction:

Library and Information Services of Higher Education institutions play a crucial role in enhancing the quality of study-teaching and research environment. Best Practice may be innovative and be a philosophy, policy, strategy, program, process or practice that solves a problem or create new opportunities, which is positively impact in an organization. In general, the use of technology and innovative ideas lead to evolve best practices in library and information environment. The primary aim of the library is to offer a various services to the readers for meet their specific information.

The main purpose of a library is to liquidate illiteracy and to disseminate knowledge throughout a country. During Rabindranath Tagore's foreign travel he closely observed the functions of the foreign libraries and collected from their gardens new ideas and practical thoughts for his country, which he distributed through his pen. He created the Visva-Bharati library, one of the premier libraries in India. It is essential to give some introduction of this University, before explain best practices at Visva-Bharati Library Network.

By the beginning of the twentieth century Tagore had already become a reputed Poet. Why then did he think of starting a school? Experts in the field have different explanations. Some feel that Tagore's own tragic experience in schools, modelled by the then British rulers of the country could be the reason. Tagore wanted his school to be in the model of Tapovana of ancient India. Thus, he moved from Kolkata to a placed called Santiniketan. Which Tagore's father, Maharshi Devendranath had chosen for his

meditation and other religious activities. Soon the school started to grow. Students from different walks of life and even other states of the country came to join the institution. This Asrama Vidyalaya became "Visva-Bharati" on 22nd December 1921 it became a Central University by an Act of Parliament of India in 1951. Visva-Bharati Library in Santiniketan subsisted with the establishment of the Ashram Vidyalaya since 1901 with Tagore's own book collection, which were transferred from Jorasanko, Kolkata. Tagore said that the use of books for the educational development of students. And thus Santiniketan Library developed and enriched with the great care and nourishment of Gurudev Rabindranath Tagore. Visva-Bharati has a good collection of about 8.52 lakhs print resources and provide access to about 1, 40,000 e-resource (including 8,500 e-journals) to the users of the University. These are documents in its Central Library along with 12 sectional libraries and 30 seminar libraries. The Library has around 10,000 users and a daily transaction of 450 books. The main function of a University library is to help students and research scholar with necessary books, journals and bibliographies through a concentrated reference service for their work.

2. Management and Administration of Library:

University is a composite body of several academic departments, the set-up of a university library is also a harmonious combination of several departmental and a central library. The library committee which is usually formed by the academic council of a university is an advisory body. The committee guides the policies of the library regarding book- selection, allocation of funds to respective subject-heads and general administration. Allotment of funds for the collection of e-resources should be passed in the Library Committee meeting immediate after the Grant received from the UGC or other funding Agency. The 'E-Resource selection Committee' comprising University Librarian, Faculties and Administrators is constituted by library committee.

2.1 In -service program:

Management of libraries is not merely a matter of bibliographic control of the materials or rendering of services, but also that of ensuring that the library staff are better equipped to achieve these objectives and that, consequently, readers are provided with the best possible service. In this connection Visva-Bharati Library management is also focused on methods of improving the efficiency of the library staff in the libraries. Staff members are given the opportunity to familiarize and expertise with library automation, e-library services by arranging in-house and external training programmes. By rotation of staff at various sections, on - job training is also given. Visva-Bharati Library also started transparent promotional policy for the library staff to motivate and brings excellence in the information products and services of the library.

2. 2 Maintenance of service areas:

Central Library of Visva-Bharati Library Network provides Open Access to all its collections. In the Open Access system, user can go around the stacks and pick up documents at their own. The documents in the stacks are arranged according to the DDC number except in case of Bengali and Sanskrit. Ground and first floors are being used to keep all issuable books, whereas second floor is earmarked for parking special collections, collections of old books, print version of digitized books and old reference books. Visva-Bharati Library gets cleaned in every day manner by the designated staff. Removal of dust and cobwebs from the book shelves in done regularly.

2. 3 Earn while learn programme:

Visva-Bharati Library has part-time jobs for the students to work in the Library under 'earn while learn'

program. Students of different departments can apply for Library Assistantship Programs in the library with monthly Rs.500/- remuneration. This has improved the relationship between students and library staff for library services.

3. Collection and Services:

Best practices in collection development would include a well defined Collection Development. Each Library ensures access to peer reviewed journals procured by individual and/or consortia approach as well as networked access to documents of all types available in other academic libraries through inter-institutional cooperation. Visva-Bharati Library is a hybrid library with the acquisition of digital collection with the print collection.

3.1 Storage of less used collection:

Every Library will have its less used collection. These collections will increase due to the syllabus changes, out dated contents etc over the year. The process of separating less used collection is done with the help of circulation data and the suggestions of Faculty and Students. These less used books are being stored in the storage unit. As all these books are already in the digital database, therefore their location will be shown on dormitory storages at the computer.

3.2 Library book exhibition:

Every year Visva-Bharati library organise books exhibition in the Central Library premises for the book selection by the faculty and student of the University. All over India reputed publishers and distributors are invited to display their recent edition books in the exhibition. In this Way University library develops their collection with latest edition of printed books and side by side students also gets aware about the latest books of their interested subjects.

3.3 Extended library opening hours:

The Central Library of Visva-Bharati remains open from 7 am to 8pm throughout the year on all normal working days. On Wednesday and Thursday (weekly off) and holidays it is kept open from 10am to 5 pm. The Central Library is open all days of the year except three closed holiday's viz., Republic Day, Independence Day and Gandhi Jayanti. The Central Library provides uninterrupted reading facilities to the users in a beautiful atmosphere.

4. Extent of the Use of Services:

Hence continuous user promotion and information literacy programs have to be launched with novel ideas to enhance the use of services in the Library. We organised Library workshop, debate completion and talks with specific topics.

4.1 User orientation:

Every year Visva-Bharati Library Network organise 'User Orientation Programme' for the newly admitted students in UG & PG level of various department of the University. Creating awareness on library resources, facilities and services among new users and thus to ensure optimum use. Students attend the programme according to their allotted timetable given by the Library and also know the location of the resources material available in the library.

4.2 Library best user award:

To attract the students Visva-Bharati Library Network conferment of best Users Award – 2019 to Smt. Abheri Sarkar, Research Scholar, Sangit Bhavana. Cash/books in the form of award are given to best

user from each discipline in the University every year.

4.3 User feedback:

In our 'Library user manual' user feedback form are there to express the problem regarding the use of library and suggestions for better performance of the Library. This feedback form is collected in regular interval for the betterment of library.

5. Use of Information Technology in Libraries:

Modern age is the age of information. Information communication technology (ICT) has tremendous impact on knowledge society for collection, processing and dissemination of knowledge-based products and services. Library being a knowledge hub, now-a-days it is dependent on ICT for its services. The best practices need to be constantly updated as the implementation of Information Technology Tools are used in Libraries with the changes that are taking place in the Information Technology applications.

5.1 On-line information retrieval:

Designing and establishing the infrastructure for a suitable networked environment in a library is more important and it has impact on its information services. Networked environment usually means an intranet, which is a set of Local area Networks (LANs) within an organization. More widely, it also means internet. Visva-Bharati Library System is connected with the Campus wide Fiber Optic Network named GitanjaliNet(INFLIBNET) with compatible hardware(Switches, Routers, Servers, etc) and software(Operating software, Application software).

Visva-Bharati Library has 92PCs, 39 printers, 25 scanners, digital camera, etc for its central Library and Sectional Libraries. All PCs are connected with the Servers (library Database Server, Server used for Digital content, Server for IR and Gateway Server) through Optical Fiber in both campuses.

5.2 Free browsing Unit:

OPAC is an online catalogue facility that enables speedy searching of library database including books, journals, periodicals and manuscripts spread over all libraries under Visva-Bharati Library System. OPAC terminals are available in the where from databases could be accessed. The WebOPAC (OPAC on the Internet) facilities access to OPAC from anywhere, anytime through the Library website (<http://172.16.2.132/library/index.php>). It is necessary to

evaluate the resources on the web and integrate URL link to OPAC for the users to access filtered and appropriate information.

5.3 Digital access to all internal documents:

Visva-Bharati Library Network resources & services and their links – 4.3.1) Catalogue of books 8.52 lakhs, E-books (full text) -3836 & a lakh plus from consortia, Digitized Book (Full text) 29689 and theses (digital full text) 1650. All digitized document has been stored into the server. Separate user-friendly search interfaces had been created for searching the digitized documents/syllabus/question paper. Therefore these can be accessed, downloaded

and /or printed over the campus network through Central Library web page (<http://14.139.211.2/library/index.php>)

We get the usages statistics in details through Webalizer software, a fast and free web server log file analysis program. It produces highly detailed, easily configurable usage reports in HTML, format for viewing with a standard web browser.

5.3.2 Journals:

Print Journals (233) <http://172.16.2.132/joomla/index.php> , Online Journals (8500). 4.3.3) Online Databases available in the Visva-bharati Library: JSTOR, Artstor, J-gate Plus, IndiaStat.com.

5.3.4 Institutional Repositories:

Scanned old question paper, syllabuses, and Faculty publications since available 2005 onwards. Visva-Bharati Library collects question paper in each semester of different departments and uploads on the website for the use of the students of the University.

5.3.5) CD-ROM:

650+ containing text materials with problem and solutions, 50+ containing music items, 25+ containing animations, 40+ containing learning materials of different languages, 5+ containing reference materials, 106 DVD containing 5200 full texts of old books. 4.3.6) Services: Open Athens (Remote Access), Web of Science (citation Database), EndNote (Reference Manager), Inter –Library Loan (Delnet, BCL,AL,GVL), Scholarship Database, URKUND (Anti-plagiarism software), There are three important search engines; web-OPAC, Discovery Services and J-Gate Plus. Lastly know your Library/FAQs for details, related to library facilities and services, in quick reference form. Free access online E-resources: the Visva-Bharati Library is getting free access for a good number of e-resources (e-books & e-journals, etc) through UGC-infonet Digital library consortia and from different publishers. First, we make an announcement in details through library website and we make certain that users can access it easily by creating list from an A-Z and making a link t the server with the particular title/article.

5.4 Searchable Databases:

Book (Print), E-Books, Digitized Books, CD-ROMs, Theses & Dissertations, Article Database, Journals & Bound Journals.

5.5 Campus Connectivity:

Under MHRD is Established of 1 GBPS connectivity to all Central Universities. On the lines of ‘Digital India’ initiative of the PMO, the MHRD has now decided that the campuses of Universities (having 1 Gbps bandwidth) shall be made Wi-Fi enabled campus.

Institutional Repository: Institutional Repository (IR) of Visva-Bharati faculty, staff & scholars has been actually started since 2011, when research publications have been shared to library for upload on Visva-Bharati website. The new interface through joomla has been implemented in the month of April 2017 with different types of functionalities and search interface. In the latest updates users can freely truncate their search term by different types of search terms like title, type of publication, author, year of publication, bhavana/subject/research etc.

Indiastat.com, an initiative of Datanet India Pvt.Ltd. was established as an IT-enabled private limited company in February 2000 to provide socio-economic information service. Indiastat.com provides secondary level socio-economic statistical information about India, its states, region and sector.

Zotero: next generation research tool – Zotero is free, easy to use tools to help you collect, organize, cite and share your research sources. It lives right where you do your work- in the web browser itself. It is available as an add-on for the Firefox web browser.

5. 6 Electronic surveillance system:

Visva-Bharati Library has already installed CCTV surveillance for security purpose. Since library is

open for longer hours with limited staff working in shift in duties therefore for security reason CCTV is necessary in the library area.

6. Conclusion:

Visva-Bharati library Network has been trying to apply green library concept at the Central Library for the past three years. It could have been more successful efforts for the introduction of solar energy was materialised. However the concept could be introduced and inculcated amongst the professionals in the library Network. Following are some of its achievements:

6.1. Library is an independent building

6.2. The new Annex Building is green. The design is almost eco-friendly due to day light design. Sunlight comes through the roof top glass dome. The Annex building is totally cross ventilated. Conscious efforts made reduce the use of hazardous chemicals inside/outside the library.

6.3. Library services: Green Initiative- Accessing Information through OPAC and MARC records. VBL is Co-operation/Inter-library loan to avoid duplication in library collection and providing digital material to patrons. Provision of remote access to resources (Open Athens)

is also available beyond the campus. University library try to Switching over to electronic resources. On line publication and distribution of VBLN Library e-Newsletter and other outreach publicity materials in electronic format. VBL has adopted of QR Codes on the network as well as various services & facilities.

Librarian who is the traditional information resource manager has a vital role to play in the context e-resource management. They are responsible for information resource management in effective and efficient way. Therefore Information literacy and user awareness programs are seemed to be normal practices in the academic library in its effective implementation and enhancing the use of information sources. Hence Visva-Bharati Library adopting new techniques and tools in imparting user education may be of best practice in extent of use of library services. To cope up with the changing environment, the Visva-Bharati Library is also trying to procure and manage e-resources with the help of the technology-based solution and ICT based infrastructure. Visva-Bharati Library is also developed good Library web page for disseminating information due to advent of technology. It is expected that the Visva-Bharati Library will develop a complete ERM system soon overcoming with the few problems. Such practices successfully adopted by this library are worthy of being labelled as best practices.

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Application of Cloud computing in Academic Library: A case study of Raja Peary Mohan College, Calcutta University

Shraboni Das

Librarian, Raja Peary Mohan College, Uttarpara, Hooghly

Email: shraboni.roy@outlook.com

***Abstract:** Cloud computing technology originates as a groom for various types of libraries. It is offering different opportunities for libraries to append their services with clouds. Mainly in Academic Library it is used for storing, managing, accessing and sharing data, and applying computing power in cyberspace. This paper describes an overview of cloud computing and its applications that can be organized with library services on the network based ambience. This paper targets to elucidate and extend various aspects of cloud computing, its uses in academic library.*

***Key Words:** Cloud computing; IaaS; PaaS; SaaS; Academic Libraries*

1. Introduction:

Cloud computing provides the capability to use computing and storage resources on a metered basis and reduce the investments in an organization's computing infrastructure. The bring forth and deletion of virtual machines running on natural hardware and being maintained by hypervisors is a cost-efficient and flexible computing paradigm. In addition, the integration and widespread availability of large amounts of 'sanitized' information can be of tremendous benefit to users and researchers.

Dr. Ranganathan's fourth principle excellently applied in Cloud Computing. Save the time of reader in a library by providing information anytime anywhere. Library should be able to plan their services in such a way that a user gets it 24x7. More efficient distribution of library services with minimum time. In present decade, cloud computing is founded as one of the most popular virtual technology for academic libraries to offer their services in an efficient process. Cloud computing technology is delivering great advantages for libraries to join their services not only quickly but also in new formats with the flexibility such as access any where any time, pay as you use model, and so on.

0.1 What is Cloud Computing?

Peter Mell says on October, 2009 presentation titled "Effectively and Securely Using the Cloud Computing Paradigm," and according to Tim Grance of the National Institute of Standards and Technology (NIST), definition of cloud computing are as follows:

Cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable and reliable computing resources (e.g. networks, servers, storage, applications, services)

that can be rapidly provisioned and released with minimal consumer management effort or service provider interaction.

Wikipedia define that "Cloud computing is Internet-based computing, whereby shared resource, software, and information are provided to computers and other devices on demand, like the electricity grid."

V. Mware, the global leader in virtualization and cloud infrastructure definition" "Cloud computing is a new approach that reduces IT complexity by leveraging the efficient pooling of on-demand, self-managed virtual infrastructure, consumed as a service"

2. Literature Review:

Like other utility services available in today's society, cloud computing services are now available on demand, [Buyya, Yeo, Venugopal, Broberg, and Brandic, 2009]. This is not a new concept. Many years ago, since 1961, John McCarthy, retired Stanford professor and Turing Award winner, in his discourse at MIT's Centennial, forecast that in the future computing would become a 'public utility' [Wheeler and Waggner, 2009]. In 1969, Leonard Kleinrock, one of the chief scientists of the original Advanced Research Projects Agency Network (ARPANET) project, said: 'As of now, computer networks are still in their infancy, but as they increased and become sophisticated, we can probably see the spread of "computer utilities" which, like present telephone and electric facilities, will serve separate domestic and offices across the country' [Kleinrock, 2005, p. 4]. Cloud computing is differ from the other computing system. Academic Library is benefited in three basic areas: Technology, data and community [Goldner, 2010].

3. Objectives:

- To elaborate the concept of cloud computing.
- To find the library services that is delivered with the help of cloud computing technology.
- To investigate present situation of academic libraries in West Bengal in order to adopt cloud computing into their library services.

4. Characteristics of Cloud Computing:

This cloud model is composed of six essential characteristics. The six essential characteristics are as follows:

- On-demand self-service
- Ubiquitous network access
- Resource pooling
- Location independence
- Rapid elasticity
- Measured service

5. Models of Cloud Computing:

This cloud model is composed of three service models and four deployment models.

5.1 Service Models:

5.1.1 Cloud Software as a Service(SaaS): NIST defines Cloud Software as a Service (Saas) as follows: "The capability provided to the user is to use the provider's applications running on a cloud infrastructure.

The applications are available from different devices through a client interface such as a web browser. The user does not manage or control the underlying cloud infrastructure, including network, servers, operating system, storage, or even individual application capabilities, with the possible exception of limited user-specific application configuration settings.”

5.1.2 Cloud Platform as a Service (PaaS): PaaS is similar to SaaS, but the service is an entire application development environment, not just the use of an application. PaaS solution differs from SaaS solution in that they provide a cloud-hosted virtual development platform, accessible via a Web browser.

5.1.3 Cloud Infrastructure as a Service (IaaS): Infrastructure as a Service (IaaS) is a cloud model that most clearly demonstrated the difference between traditional IT infrastructure and the cloud-based infrastructure service. In the manner of the IaaS describes the delivery of the computing infrastructure as a service.

NIST define four cloud deployment models.

4.2 Deployment models:

4.2.1 Private Cloud: The cloud infrastructure is operated solely for an organization. It may be managed by the organization or a third party and may exist on premise or off premise.

4.2.2 Community Cloud: The cloud infrastructure is shared by several organizations and supports a specific community that has shared concerns (e.g., mission, policy, security requirement). It may be maintained by the institution or a third party and may exist on campus or off campus.

4.2.3 Public Cloud: The cloud infrastructure is made available to the general public or a large industry group and is owned by an organization selling cloud services.

5.2.4 Hybrid Cloud: The cloud infrastructure is formation of two or more clouds (public, private or community) that remain separate entities but are bound together by standardized techniques that enables data and application portability (e.g., cloud bursting for load-balancing between clouds).

6. Examples of Cloud services:

I. Key Players in Cloud Computing Platforms (adapted from Lakshmanan (2009))

Company	Cloud Computing Platform	Year of Launch	Key Offering	Logo
Amazon.com	AWS (Amazon Web Services)	2006	Infrastructure as a service (Storage Computing), Datasets and Content Distribution	
Microsoft	Azure	2009	Application platform as a service (.Net, SQL data services)	
Google	Google App. Engine	2008	Web Application Platform as Service	
IBM Salesforce.com	Blue Cloud Force.com	2008	Proprietary 4GL Web application as an demand platform	

7. Enhancement of Library Services By The Use Of Cloud Computing:

- E-document delivery Service: Cloud path is now becoming more useful to delivery the Documents.
- Web OPAC: Libraries can give access to their collection on one platform and use same path.
- Shared Catalogue/Union Catalogue: Union catalogue creation becomes very easy through cloud computing.
- E-document Download Service: If in the network permitted access one can easily download any kind of documents.
- Information Orientation/ Literacy: Libraries can organize information orientation programs for users on the cloud. They can preserve presentation, tutorials, files and videos on the cloud for user's orientation.
- Article Delivery Service: Through cloud computing libraries can easily provide article delivery service to the patrons. Online publishers are already using this platform for providing their services.
- Centrally Scanning Service: Digitization of printed documents can be done centrally. For that any libraries can avoid duplication of work and this is also time saving.
- Collection Development: A Library can use Cloud computing for collection development. Repetition can be easily staved off and alternate resources can be made accessible to users.
- Digital preservation: Libraries can preserve archives of all the collection in digital forms.
- Current Awareness Service: For libraries it is become easy to provide current awareness service to all patrons with cloud computing.
- Document Sharing: Document sharing in digital media has become easy with cloud computing.
- Bulletin board service: Libraries can provide new services on bulletin board through this platform.
- Information Common: Example of information common is syllabus, bibliographical data, cover pages, content pages, question papers and other reading material. Libraries can share this kind of information in one platform. This process improving economic condition of library and avoids extra purchase of library.
- File sharing: For different types of files shearing is in electronic form become simpler with the cloud computing.
- Information Discovery: For preserving all type of information Cloud provides a platform where anyone can easily access information from anywhere at 24×7 hours; so discovery of information and searching become faster and it is very helpful for users.
- Social Interactions with the users: Through different type of social media in the cloud it can be possible.

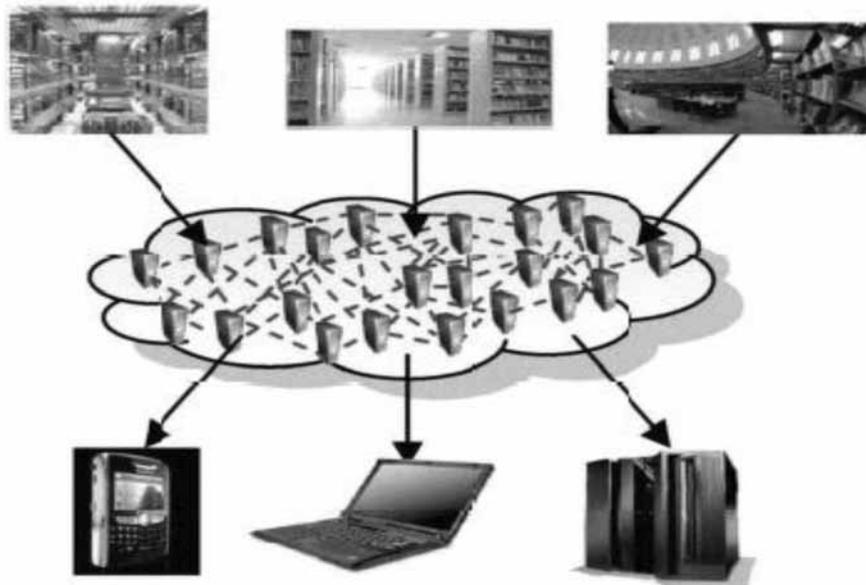
8. Role of Librarian in cloud computing technology:

- ✓ To know the information of all type transactions.
- ✓ To maintain usage record of cloud resources.
- ✓ To develop Digitization work for digital collection.
- ✓ To give access to the users through username and password and define validity period.

(Password can be auto generated; Time period must be set in the software)

- ✓ To interact with the patrons, libraries share their resources to cloud for resource sharing.
- ✓ To communicate with Cloud based resource contributor and get it with best agreement.
- ✓ To consult with subject experts, faculty members and librarians for ready up various modules for different classes.
- ✓ To update technical proficiency.
- ✓ To provide technical support to enroll libraries
- ✓ To organized awareness programs and training for patrons.
- ✓ To give interlibrary loan facility to members libraries.
- ✓ To maintain record of print resources to give referral services.
- ✓ To make libraries e-profile by creating blog or social network profile to communicate with the patrons. The same process can be used for serving reference services and teaching the users on cloud resources.

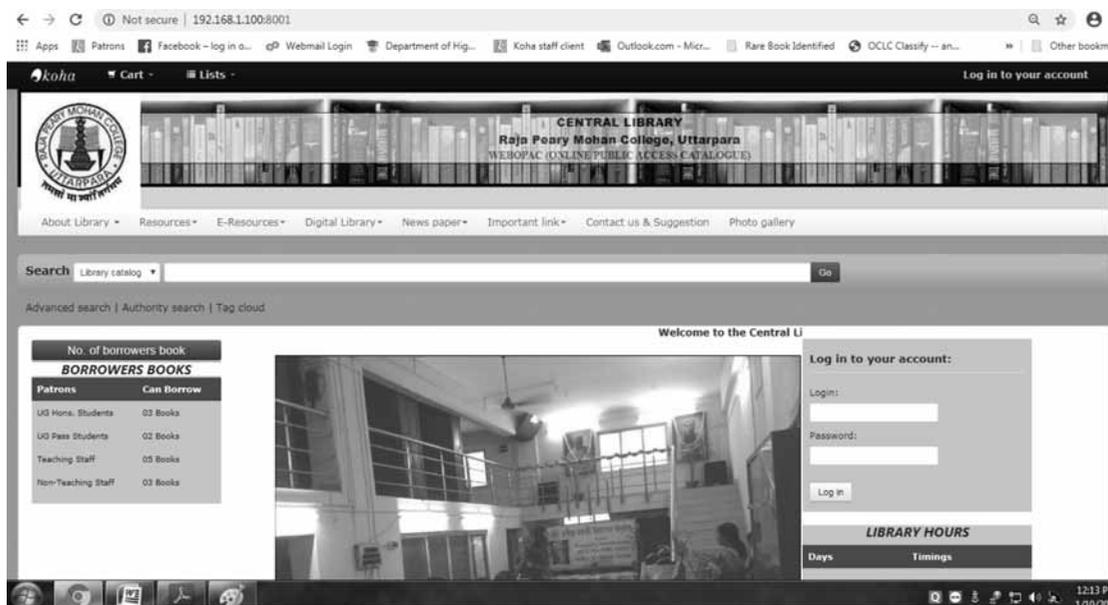
9. Areas where cloud computing may be deployed in RPMC Central Library:



Application of Cloud Computing in Academic Libraries

Academic Libraries are extending their services through the cloud computing which take measures access to limitless resources neutral of geographical location and time (Mate, 2016). Clouding technology give many facilities to academic libraries by providing platform for uploading data into the cloud with security.) Fox(2009) stated that in his research work titled “An exploratory study on factors affecting the adoption of cloud computing by information professionals, have found that the behavioral intention to use cloud computing was impacted by perceived ease of use and personal innovativeness”.

- a. **Library Automation:** For the purpose of library automation, Polaris provides different cloud based services such as cataloguing, acquisitions, digital contents, and process system. It also supports various standards such as MARC21, XML, Z39.50, and Unicode and so on. These standards directly related to library and information science area. Afterwards, nowadays many of the software vendors such as Ex-Libris, OSS Labs are also give this service on the cloud. RPMC central library previously automated with Libsys software. After that they convert in Koha since the year 2017.
- b. **Website Hosting:** Mavodza (2013) says that website hosting is one of the modern adoptions of cloud computing. Many academic institution including libraries host their websites through on third party service providers rather than hosing and maintaining their own service. In RPMC Library, Avior Technology host libraries website and this wed site can be update maintain by the librarian.
- c. **Searching Library Data:** RPMC Central Library today has online catalogues and share bibliographic data through OPAC system. And try to extend these facilities through Web OPAC. On the other hand many academic libraries provide this service with Online Computer Library Center (OCLC). OCLC is one of the greatest examples of cloud computing for distributing libraries data.



- d. **File storage:** In present RPMC Central Library use DSpace for store college data like Question paper, Syllabus Video tutorial, e books etc. To preserve data on the cloud many services are available such as Amazon Cloud Drive, Sky Drive, Dropbox, Jungle Disk, Bitcasa Infinite Drive, iCloud, SugarSync, OneDrive, Apple, Evernote etc. These technologies avail virtual share and access of e resources remotely.

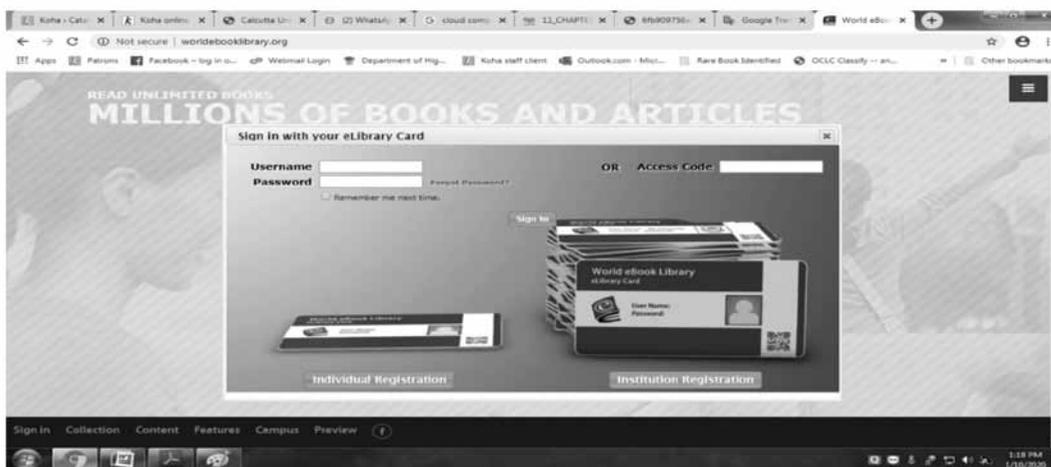
Therefore, academic libraries can get advantages of such cloud based services for various purposes. Such as, LOCKSS (Lots of Copies Keeps Stuff Safe), CLOCKSS (Controlled LOCKSS) and Portico tools are used for digital reservation purpose by libraries.



- e. **Searching Scholarly Content:** RPMC Central Library is a proud member of NLIST, (INFLIBNET) National Library and Information Services Infrastructure for Scholarly Content. It is part of UGC Infonet Digital Library Consortium to extend e-resources to colleges. An initiative of Ministry of Human Resource Development (MHRD) under the NME-ICT now funded by UGC, as college component under UGC-INFONET Digital Library Consortium, it gives us access to over 6000+ e-journals and, 97000+ e-books. RPMC Library is also a member of National Digital Library of India. 44,768,364 items hosted in NDL India.
- f. **E-Newspaper:** at present almost all news paper are available in internet. Libraries can only interlink the news paper's website in their own webpage. RPMC library is interlinked all the valuable newspaper's website with their website.



- g. **Digital Library/Institutional repository:** There are many digital libraries in the cloud. Any academic libraries can serve this kind of digital libraries facility to the users through internet. RPMC library interlinked some digital libraries in their own web site. Some example is World eBook Library, Digital Library of India, Internet Archive etc.



h. Video Library: Video library is more acceptable concept for the users. Where they can learn any program with the help of video lecture. With free tutorials anybody can teach themselves almost anything online. Many video library are in the cloud. RPMC Central Library can try to impliment this facility for there users.

II.A list of Video Library

Name	Subject	URL
Code school	IT Ops,data Professional, Software development, Information and Cyber Security	https://www.pluralsight.com/codeschool
Codecademy	Web Development, Programming, Data Science, Partnerships, Design, Game Development	https://www.codecademy.com/
TutsPlus	Design and illustration, Code, Web Design,Photoshop, Business, Music and Audio	https://tutsplus.com/
Lynda	Animation,BusinessInteligency, Career development,	https://www.lynda.com/
Treehouse	frontend, backend, database management,app development	https://teamtreehouse.com/
Udemy	Business, IT software, Marketing, Music,	https://www.udemy.com/
Coursera	History, Philosophy, Music and Arts, Physical Sc., Health Sc.,	https://www.coursera.org/

10. Advantages of cloud Computing:

- Easy access to resources through internet
- Cost reduction
- Automatic software
- Back-up and recovary
- Unlimited storage

11. Disadvantages of Cloud Computing:

- Security issue

- Lack of support
- Lack of knowledge
- Technical issue
- Training programme for staff and users are costly

12.Conclusion:

Cloud computing is not a totally new concept in the library and information science field. All the academic libraries are facing problems of growth of information resources in this IT era. Cloud environment is an extremely developed network environment. The cloud computing model will cheer up all academic libraries and their users to participate in a network and community of libraries by enabling them to reuse information & socialize around information. It can also create a strong, unified presence for libraries on the Web and give users a local, group and global reach.

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Space Utilization in College Library Building in South 24 Parganas District

Jayita Naskar

Ph.D. Scholar, Dept. of library and Information Science
Jadavpur University
Email: jayitanaskar39@gmail.com

Monoj Tudu

Ph.D. Scholar, Dept. of library and Information Science
Jadavpur University
Email: monoj.tudu@gmail.com

Koushik Pathak

M.Phil. Scholar, Dept. of library and Information Science
Jadavpur University
Email: koushikpathak2002@gmail.com

Abstract: *This study illustrates about the use of space in the college library building in South 24 pgs district. The main objectives of this study is to consider about the architectural aspect of library building such as internal layout, physical facility, hygienic environment within and outside the library building and to suggest the remedies regarding the proper utilization of space for improve the use of library and their resources. In order to investigate the problem, it has been intended to adopt survey method for data collection by random sample method. Then the collected data is analyze and interpreted. Proper utilization of library space, ventilation system, security measure taken in the library, physical facilities of the library and Cleaning and maintenance of the building of South 24 pgs college library are discussed with the basis of data collection.*

Keywords: *Space utilization; College library; Green library*

1. Introduction

College is an institution that acts as a chain between preliminary and higher education. College also offers vocational education. Nowadays, in the field of higher education, there is a need on the utilization of libraries. To fulfill the requirement of the user of the college library, there is a need to gather information. College library also plays a significant role in the promotion of higher education by creating good atmosphere within the library. These also stimulate the students to use the library and to improve their knowledge. So that, atmosphere and the design of library building is one of the important parts for acquiring knowledge. An unsatisfactory design of library building can hamper the use of the library. Therefore an attractive, well equipped library is necessary.

Space utilization in the libraries is also essential for the users of the library. Many seats may be needed for the users who spend their time in the library. But there are such kinds of users who may not spent their time in the library instead to select material and borrow it for home. Therefore this type of library may not need many seats. Thus, number of seats needed in a library will depend on how large a community library serves.

2. Review of literature

Mary Augusta Thomas (2006) looks at traditional library space planning and how it incorporated earlier technology is constructive. For centuries, library staff worked with paper collections, relying on hand written documents for cataloging and other procedures. K. Jakovlevas-Matecki I, Kostinate and J Pupeliene (2010) describe the character of activities and architectural solutions of traditional libraries do not answer the needs of modern information society and particularly its needs on information provision. Karen Latimer (2011) looks at changes in information provision and their significant impact on the development of the design of academic library spaces over the years. The history of the academic library as a building type is examined, and the move from the collection-dominated library buildings of the nineteenth and twentieth centuries to the service-rich user-focused ones of the twenty-first century is explored. Recent trends are identified, drawing on a number of mainly UK and other European examples. Fatt Cheong Choy and Su Nee Goh Plan (2016) for library buildings and renovation involves many considerations that relate to understanding and predicting the needs of library users. As these needs change with technology, pedagogy and indeed the larger educational landscape, library planning is not simply a listing of desirable features and spaces required. *Mary Ellen* Silas M. Oliveira (2018) also describe about top management in academic/university libraries must play a more significant role within the academic setting by reorganizing library spaces or building new libraries that will be aligned with the new teaching pedagogies and today's students' learning preference styles.

3. Objectives of the study

The central aim of the study is to identify the space utilization of college library building: a case study. The specific objectives of the proposed study are as follows:

1. To examine the number of colleges having independent library building
2. To understand whether the library building are maintain properly and the space provided is being utilized fully
3. To consider about the architectural aspect of library building such as internal layout, physical facility, hygienic environment within and outside the library building.
4. To suggest the remedies regarding the proper utilization of space for improve the use of library and their resources.

4. Methodology

In order to investigate the problem of the proposed research and to achieve the objectives of study stated earlier, it has been intended to adopt survey method for data collection. Document research will be applied for making related and relevant literature review. For the collection of data stratified accidental random sample method was used for the selection of respondents those who were found during the survey period. A questionnaire is designed to cover all objectives of the study. Among 75 questionnaires, only 65 questionnaires are answered by the respondents. These questionnaires are analysis and interpreted.

5. Data analysis and interpretation

5.1 Proper utilization of library space

Table 1 shows that proper utilization of library space in the college library. According to this table most of the respondents (66.15%) reveal that seating arrangements are very compact in the college library while 33.84% respondents reveal that there are display stands for newspaper.

Table 1: Proper utilization of library space

Sl. No	Utilization of space	Yes		No		Total
		Num	%	Num	%	
1	Seating arrangements are very compact	43	66.15%	22	33.84%	65(100%)
2	Single faced bookshelves are used	37	56.92%	28	43.07%	65(100%)
3	Double faced bookshelves are used	25	38.46%	40	61.53%	65(100%)
4	Catalogue cabinet is located near the circulation counter	41	63.07%	24	36.92%	65(100%)
5	Movable periodical display racks are provided	33	50.76%	32	49.23%	65(100%)
6	Display stand for newspaper	22	33.84%	43	66.15%	65(100%)

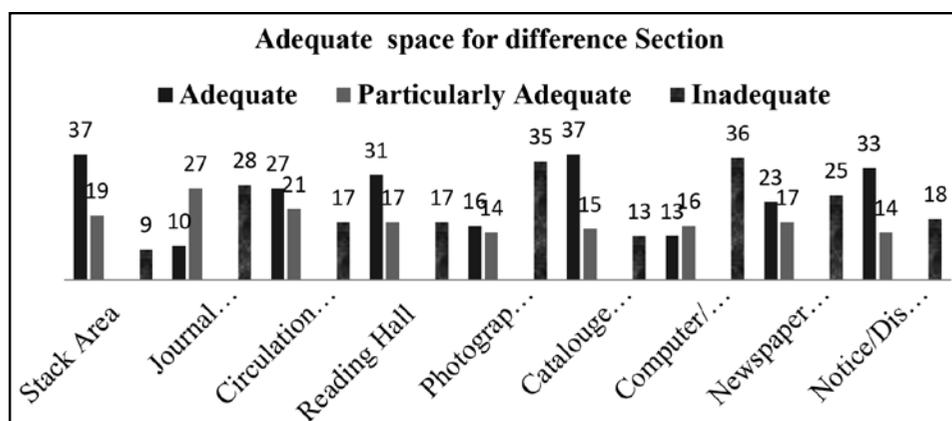
5.2 Adequate space for different section

According to the survey, 56.92% respondents reveal that there is adequate space for stack area. Whereas only 20% respondents say that there is adequate space for computer/internet. Only few participants 13.84% reveal that there is in adequate space for stack area.

Table 2: Adequate space for different section

S1. No	Space for different section	Adequate		Partially Adequate		In adequate	
		Num	%	Num	%	Num	%
1	Stack area	37	56.92%	19	29.23%	9	13.84%
2	Journal Section	10	15.38%	27	41.53%	28	43.07%
3	Circulation counter	27	41.53%	21	32.30%	17	26.15%
4	Reading hall	31	47.69%	17	26.15%	17	26.15%
5	Photocopy Area	16	24.61%	14	21.53%	35	53.84%
6	Catalogue area	37	56.92%	15	23.07%	13	20%
7	Computer / Internet	13	20%	16	24.61%	36	55.38%
8	Newspaper section	23	35.38%	17	26.15%	25	38.46%
9	Notice /Display area	33	50.76%	14	21.53%	18	27.69%

Figure 1: Adequate space for different section



5.3 Ventilation system in library

Table 3 shows that most of the respondents reveal that the ventilation system in the college library is good enough. According to this table, 76.70% respondents say that there are big windows for sufficient ventilation, 83.07% respondents say that light in the library is well spread, 66.15% say that reading rooms are extremely airy and fresh, 75.38% reveal that library has adequate artificial and natural lighting and 78.46% say that Corridors of the library have natural and artificial lighting.

Table 3: Ventilation system in library

Sl. No	Type of Ventilation	Yes		No		Total
		Num	%	Num	%	
1	Big windows for sufficient ventilation	46	76.70%	19	29.23%	65(100%)
2	Light in the library is well spread	54	83.07%	11	16.92%	65(100%)
3	Reading rooms are extremely airy and fresh	43	66.15%	22	33.84%	65(100%)
4	Library has adequate artificial and natural lighting	49	75.38%	16	24.61%	65(100%)
5	Corridors of the library have natural and artificial lighting	51	78.46%	14	21.53%	65(100%)

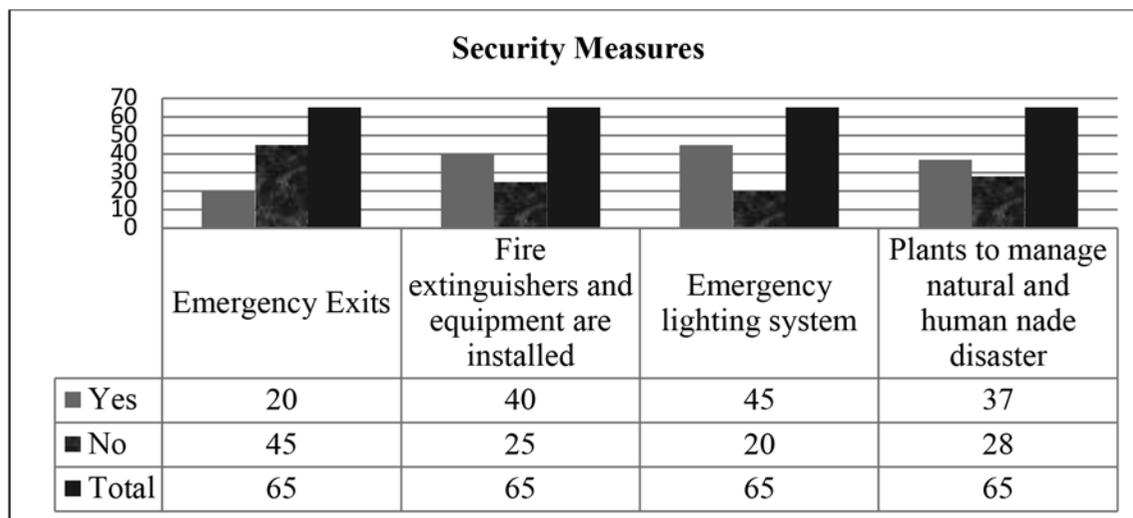
5.4 Security measure taken in the library

Most of the respondents are not satisfied about the library security measure. Only 30.76% respondents say that there are emergency exit in the library, 61.53% reveal that fire extinguishers and equipments are installed, 69.23% say there are proper emergency lighting system and 56.92% say that there are proper plans to manage natural and human made disaster.

Table 4: Security measure taken in the library

Sl. No	Security measures	Yes		No		Total
		Num	%	Num	%	
1	Emergency exits	20	30.76%	45	69.23%	65(100%)
2	Fire extinguishers and equipments are installed	40	61.53%	25	38.46%	65(100%)
3	Emergency lighting system	45	69.23%	20	30.76%	65(100%)
4	Plans to manage natural and human made disaster	37	56.92%	28	43.07%	65(100%)

Figure 2: Security measure taken in the library



5.5 Physical facilities of the library

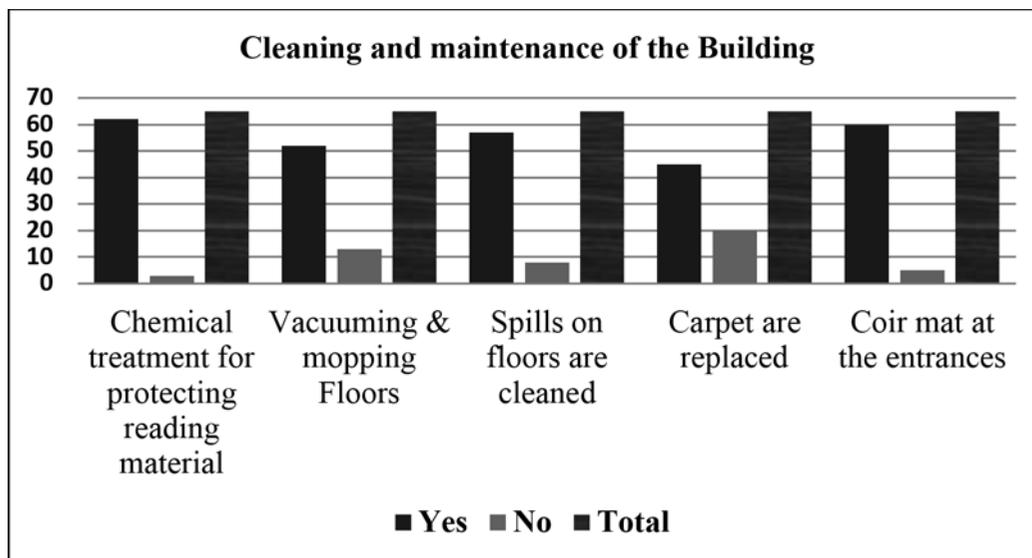
From the table 5, it has been shown that most of the respondents are satisfied with the physical facilities of the library. They say that there are adequate physical facilities in the library such as reading chair, reading table, newspaper display stands, Xerox facilities, drinking water and toilet.

Table 5: Physical facilities of the library

SL. No	Physical facilities	Adequate		Partially adequate		Inadequate	
		Num	%	Num	%	Num	%
1	Reading chairs	54	83.07%	8	12.30%	3	4.61%
2	Reading table	56	86.15%	7	10.76%	2	3.07%
3	News paper display stands	49	75.38	11	16.92%	5	7.69%
4	Xerox facility	35	53.84%	7	10.76%	23	35.38%
5	Drinking water	45	69.23%	10	15.38%	1	1.53%
6	Toilet and wash room	55	84.61%	8	12.30%	2	3.07%

5.6 Cleaning and maintenance of the building

From the figure below, most of the respondents say that proper cleaning and maintenance methods are applied in the college library. Cleaning methods such as chemical treatment for protecting reading material, vacuuming & mopping floors, spills on floors, carpet, coir mat are applied in the library. Whereas, only few respondents are not satisfied with the cleaning and maintenance system of the library building.

Figure 3: Cleaning and maintenance of the building

6. Conclusion

To conclude it may be said that library buildings have not given proper attention for its space utilization. This paper offers some general proposals that draw the attention of the librarian and the college authorities also. It is hoped that college authorities, college librarian will take proper steps for the betterment of this condition.

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Application of Mind-mapping in Library

Sonali Dutta

M Phil. Student, DLIS, Jadavpur University, isonalidutta210@gmail.com

Abhishek Gupta

Student, MLibSc. DLIS, Rabindra Bharati University, guptaabhishek041@gmail.com

Saptarshi Khanra

M Phil. Student & Project Fellow, DLIS, Jadavpur University,
saptarshiblis2016@gmail.com

Abstract: *Mind map is very useful and powerful tool for setting a goal in life/work and its far reaching applications for the library from strategic planning and overflow optimization to daily problem solving and syllabus development. Key features of mind mapping tools will be presented to help readers determine the best product for their individual needs. This paper provides an overview utilization of Mind mapping applications in libraries and information canterers. This paper also discusses how to choose a proper mind mapping software and provide an excellent service through mind-mapping software.*

Keywords: *mind map, mind mapping software, Library*

1. Introduction

A mind map is a spontaneous way of showing the association between ideas. What is mind mapping actually? Mind mapping and concept mapping are ways to visually represent information and ideas. Though often used interchangeably, educators define them in distinct ways. Many school children practice diagramming a sentence in school to see how the words in a sentence relate to each other – mind maps expand that concept to other applications. Structured ideas which have been recorded are remembered more readily, and mind mapping facilitates this process as well as serving as a tool to stimulate new ideas. Uses of mind maps range from studying, to brainstorming, to project/task management, and even to outlining a paper to be written. Mind maps have an almost magical power to bring clarity to a process. We propose that mind-maps are an equally valuable source for information retrieval as are social tags, emails, research articles, etc. Consequently, our research objective was to identify, how mind-maps could be used to empower IR applications. Mind mapping itself is a powerful tool. In fields other than Library and Information Science, the value of information collections for creativity has also been noted. Muldrow and Yoder (2009) report on how reference managers are taking research to the next level.

2. Objective of the study

The objectives of the study are:

1. To point out a possible plan of action for using mind mapping in Libraries.
2. To point out library services offered using suitable mind mapping tools.
3. To get an understanding of mind mapping tools and their application in Library services.
4. To discuss the advantages and disadvantages of using mind mapping tools in the Library.

3. Scope and Coverages

This paper is restricted in some selected mind mapping tools like Coggle, Xmind, SmartDraw, Microsoft Visio, Mindomo, Sickplan, Mindmanager, Milanote, Lucidchat, MindGenius.

4. Features of Mind mapping

- ✓ The main idea, subject or focus is crystallized in a central image.
- ✓ The main themes radiate from the central image as ‘branches’.
- ✓ The branches comprise a key image or key word drawn or printed on its associated line.
- ✓ Topics of lesser importance are represented as ‘twigs’ of the relevant branch.
- ✓ The branches form a connected nodal structure.

5. Advantages and Disadvantages

As the old saying goes, “Every coin has two sides”. Here’s an analysis of advantages and disadvantages of mind maps.

The Advantages are as follows:

- i. **Wide Adaptability:** The human brain works exactly the way how a mind map grows, thus allowing mind maps to be used in many occasions involving learning and arrangement, such as preparing an exam, taking notes, making a book summary, planning things and organizing structured tasks, etc.
- ii. **Convenient Editing:** Comparing with traditional linear texts on notebooks, a mind map can theoretically develop into unlimited branches and levels in the structure. For this reason, it’s easy and convenient to add ideas and information at any.
- iii. **Enhance Memory:** In addition to the radiant structure, the mapper can use images and symbols to his map as he likes.
- iv. **Get People Focused:** When we read a book, the texts are displayed line by line. However, things are different in the layout of a mind map, they delve from hypernym into hyponym. Such a structure helps us to focus on the links and relationships between ideas.
- v. **Concise Information:** Since the topic texts of mind maps are keywords and short phrases that can conclude the content of the corresponding idea, mind maps are a great aid in condensing plenty of information.
- vi. **No size limitation:** We are not limited to the size of our paper.
- vii. **Flexibility:** We can easily re-organize ideas by clicking and dragging.
- viii. **Co-creation:** In software that allows us to create a mind map online, we can often have multiple

users collaborating on the same mind map.

- ix. **Visual presentation:** We can use the formatting tools to create professional diagrams that we can quickly share and present.
- x. **Increases Creativity and Productivity:** Mind mapping increases your creativity and productivity because it's an excellent tool to let us generate more ideas, identify relationships among the different data and information, and effectively improve our memory and retention.
- xi. **Categorizing and organizing:** This method is a great way for us to categorize and organize the ideas us brainstormed and identify their relationships
- xii. **Attraction:** The use of colours, images, and keywords in mind mapping aids in enhancing our memory and retention.

The Disadvantages are as follows:

Mind mapping also has its share of disadvantages.

1. Mind mapping may be difficult for those people who are very logical in the way they think. In brainstorming for example mind mapping encourages you to let the flow of ideas go freely. You even need to let your intuition work. For logical people it will be hard to trust their intuitive side because logic is telling them that this way of thinking is not possible.
2. To be able to fully understand the meaning of a mind map active participation is important. You have to know that mind maps provide a self-explanatory information and structure that can be understood best by the person or people who took part in making it. So it might be a little difficult for other people.

6. Importance of Mind map

Mind mapping software ranges from simple brainstorming apps to complex data visualization and diagramming tools. Mind mapping tools can be useful in any of the following use cases:

- **Brainstorming:** Create mind maps—visually organize and present ideas. It will help incategorizing and organizing the ideas brainstormed.
- **Diagramming:** Create engineering diagrams, project timelines, architectural plans, orgcharts, network diagrams, and other business or technical diagrams.
- **Software development and web design:** Create wireframes and site map diagrams.
- **Business Intelligence:** Import and visualize live data from business applications in charts, diagrams, etc.
- **Creativity:** Mind mapping increases the creativity and productivity of a student. Identifiesgaps in student understanding.
- Developing a mind map is one of the excellent ways for anyone to sort through the thoughtsand ideas.
- The use of colours, images, and keywords in mind mapping aids in enhancing one's memoryand retention.
- Encourages contacts between students and faculty.
- Facilitates prompt feedback.

- Utilises an active learning technique.

7. Mind mapping application in Library

The ways to utilize the power of mind mapping in libraries are almost limitless. Here are only a few of the ways we suggest to get started:

- ❖ **Understand our users' needs:** Mind mapping is a useful tool to stimulate conversations among staff about who the main user groups of the library are and how each user group uses the library and its amenities as well as what their needs are (both met and unmet). By better understanding their users, librarians can then brainstorm ways to better serve all segments of the library's population.
- ❖ **Understand multi-departmental processes:** By exploring how a current process is done, employees of different areas are coaxed out of their departmental silos and encouraged to collaborate and actively problem-solve. Once all areas understand the interrelationships of their tasks, the employees are better able to uncover ways to streamline and make the processes more efficient.
- ❖ **Plan library events:** Mind mapping is a perfect tool for planning large scale library events. With nodes for speakers, food, location requirements, technical equipment requirements, transportation and staff responsibilities, it will be easy to see the event at a glance and to keep track of plans as they progress.
- ❖ **Plan a trip to a Professional Conference:** Similar to the planning of library events, mind mapping is also a useful tool for the individual librarian as he or she plans for a conference. Nodes can be arranged by day, with tasks, clothing, contacts and more organized within, or separate branches could be created for packing, setting up child care or animal boarding, outlining tasks for committee meetings, identifying vendors to visit, listing colleagues to reconnect with and organizing special events and sessions that the librarian wants to attend.
- ❖ **Plan library renovations:** Mind mapping can collect and organize feedback from staff, committees, users, as well as keep track of options from vendors of furniture, carpets, and architects.
- ❖ **Perform strategic planning:** Mind mapping was made for brainstorming plans, goals, strengths, weaknesses, threats and opportunities facing the library, and administrators will find it invaluable in making concepts more concrete.
- ❖ **Plan reorganizations:** Library Administrators will also find mind mapping to be valuable when charting possible reorganizations within the library. Maps created of desirable skill sets, like languages, computer application expertise, or specialized training like GIS or Patents can be created and then employees with the varied skills identified.
- ❖ **Create presentations or classes:** Instructional librarians will find mind mapping an indispensable tool in the syllabus design process when planning new classes. Likewise, anyone creating a presentation can use mind mapping to organize their thoughts and even as a presentation tool so as to avoid the "PowerPoint syndrome".
- ❖ **Set goals for employees:** Library managers can use mind mapping to help their employees more fully define their annual performance goals. The tool can help them identify the parts that make up a goal and help jumpstart the process of starting work on a new goal area.

- ❖ **Conduct research:** Librarians can use mind maps to outline the contents for a new research guide, or as a way to collect seemingly unrelated facts of their own research and discover new ways of relating information when working on projects that initially appear undefined and nebulous.
- ❖ **Outline liaison areas:** When subject librarians mind map the areas of concentration that their assigned departments and professors focus upon, they can better understand the needs of the departments they serve.

8. Examples of Mind Mapping Software:

There is many mind mapping software...which are very popular among users.

- i. SmartDraw – <https://www.smartdraw.com>
- ii. Microsoft Visio – <https://products.office.com/en-ca/visio/flowchart-software>
- iii. Lucidchart – <https://www.lucidchart.com/>
- iv. Milanote – <https://www.milanote.com/>
- v. Coggle – <https://coggle.it/>
- vi. XMind – <https://www.xmind.net/>
- vii. MindManager – <https://www.mindjet.com/>
- viii. Mindomo – <https://www.mindomo.com/>
- ix. MindGenius – <https://www.mindgenius.com/>
- x. Slick Plan – <https://slickplan.com/diagram/>

i. SmartDraw(<https://www.smartdraw.com>):

SmartDraw is positioned as an alternative to tools like Microsoft Visio, claiming to be much easier for the layman to use while being just as powerful and more affordable. SmartDraw provides users with more than 4500 templates for over 70 different types of diagrams, including flowcharts, infographics, landscape designs, decision trees, timelines, mind maps, engineering and CAD diagrams, and much more. It offers collaborative drawing online so users can work on the same diagrams at the same time, with an intelligent formatting engine that makes automatic adjustments to maintain your diagram's arrangement. SmartDraw integrates with MS Office, Google apps, Jira, Confluence, DropBox, Box, WordPress, and Trello.

ii. Microsoft Visio (<https://products.office.com/en-ca/visio/flowchart-software>):

From Microsoft, Visio is visual diagramming tool that works well for mind mapping as well as creating many other graphical representations. If we're already using Office 365, Visio is a top choice because it can pull data from Office 365 and let us visualize it in real-time with the charts you've set up in Visio. This functionality sets it apart from other tools, as Visio enables us to bring us data to life in dashboards that display data-linked diagrams.

iii. Lucidchart – (<https://www.lucidchart.com/>):

Lucidchart is a concept map creator and general diagramming tool well-suited to businesses of any size who want to present data visually, scaling from a few users to enterprise organizations. It's offered as a SaaS that allows users to easily and quickly create online mind maps as well as flowcharts, technical diagrams, wireframes, floorplans, process maps, org charts, ER diagrams, and dozens of other graphical

representations. This tool covers all of the bases: real-time collaboration features, easy export of projects into many different file formats, revision history, and hundreds of templates to speed up the diagramming process.

iv. Milanote – (<https://www.milanote.com/>):

Milanote is an easy-to-use concept map maker to organize our ideas and projects into visual boards. Far from a basic mind map maker, Milanote allows us to add rich media to our boards when we create a conceptual map (images, videos, links), and create as many levels of hierarchy as we wish to go deeper into topics. This drag and drop interface on this diagram designer lets us put our work side by side on an infinite virtual pinboard. It handles notes, links, images and files.

v. Coggle – (<https://coggle.it/>):

Coggle is arguably one of the most aesthetically pleasing and intuitive concept map makers on the market. This application supports real-time collaborative drawing online, allowing multiple team members to co-create mind maps and flowcharts. Coggle’s useful features include auto-arranging branches, image uploads/attachments, a full change history, and collaborative drawing.

vi. XMind – (<https://www.xmind.net/>):

XMind is a popular brainstorming app used by anyone from startups and entrepreneurs to Fortune 500 companies. It offers several practical features for making mind maps and business diagrams (org charts, timelines, etc) more useful and accessible. XMind offers some unique features for speeding up the process of making mind maps, converting mind maps into outlines, and quickly turning our mind maps into professional presentations using auto-formatting and one-click slide creation. They provide styles and themes to get you started, and as we create our mindmaps we can attach files, audio, images, and links. They also have a mobile app that users have praised as being convenient easy to navigate.

vii. MindManager – (<https://www.mindjet.com/>):

Marketed as “the world’s most powerful mind mapping software”, MindManager offers some best-in-class mind mapping and diagramming tools. It’s in use at enterprise organizations like P&G and ConEdison, but they also offer a single license for purchase by individuals. Overall, while this mind mapping software fails to offer real-time collaborative drawing, MindManager a popular, well-supported tool that comes at a simple, sensible price (we buy a license through a one-time purchase).

viii. Mindomo – (<https://www.mindomo.com/>):

Mindomo is an easy-to-learn concept map generator geared towards teachers and students, but it’s useful for small businesses and corporate agencies. It offers a suite of mindmapper tools with an emphasis on collaboration, providing users with the ability to easily co-create, share, and present their mind maps. Some of Mindomo’s most useful mind mapping tools include real-time collaboration, a template library, the ability to add links, video, and audio to mind maps, and the ability to easily search for web images directly within the app.

ix. MindGenius- (<https://www.mindgenius.com/>):

MindGenius is a combination of a concept map creator and a project planning tool. It’s designed for use in educational settings as well as for freelancers, small businesses, and agencies. MindGenius’

suite includes drag-and-drop mind map creation, along with project planning features like Gantt charts, kanban task views, and some basic project reporting tools.

x.Slickplan – (<https://slickplan.com/diagram>):

Slickplan is marketed as a diagram designer for web planning teams. It functions well as a concept map maker, but it does much more than help us create a conceptual map. It provides features tailored to website design (UX designers, content teams, app designers and developers, website marketers) and has multiple pricing plans tailored to individuals, freelancers, small teams, and agencies. Slickplans's diagram maker includes a symbology library, automated design functions, and integration with Slickplan's sitemap builder.

9. Mind Mapping Software Selection Criteria

The most important thing that a mind map does is help us represent ideas visually. Any good mind mapping app or software should give us the freedom and flexibility to easily create good-looking diagrams that effectively portray your ideas.

In this review, here's the selection criteria it is used in picking out the best mind mapping tools:

- Real-time collaborative drawing. Can multiple users collaborate in real-time, working together on the same mind map?
- Easy file attachments. Can users easily attach external files?
- Presentation & sharing tools. Is it easy to present and share our diagrams?
- Integrations: Is it a stand-alone tool, or does it sync with our business applications (such as data management, documents, diagramming, development, and presentation tools)?

10. Conclusion:

With its development in the late 1960s by Tony Buzan as a way of helping students, mind map helped and helps the students as well as library users a lot. In this paper, we have discussed about what is mind map, its features, its advantages and disadvantages, its importance, its application in library. Also we have given some mind mapping software and its process of applications. There are some criteria also for selection of mind mapping software. In short, from this paper one can be familiar with mind map, its features and how it can be applicable in library.

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Green Library: Towards Sustainable Development

Ibrahim Mollick

PhD Scholar, DLIS, Jadavpur University, Email: ibrahimmollick0@gmail.com

Sanu Mondal

PhD Scholar, DLIS, Jadavpur University, Email: mondalsanu13@gmail.com

Abstract: *Libraries are fruits and roots of great civilizations. From times immemorial, a library is a temple of learning where light of knowledge burns brightly. These are rich springs from which knowledge flows to irrigate the wide field of education and culture. The idea of green libraries attracting attention of library administrators worldwide and the efforts to build a green library are increase. In recent years, librarians have become more interested in making their buildings more environmentally friendly. This paper discuss about the Feature of a green library involved for location selection, water and energy conservation, building materials and indoor and outdoor air quality etc and requirement to build a green library.*

Keywords: *Green Library; Green Library Materials; Indoor Air Quality; Energy Conservation*

1. Introduction

The sustainable development of human society has been significantly challenged by worldwide ecological destruction and resource shortages. As a result, it has become an important and common social issue to address environmental problems and promote environmental education worldwide. In recent years, the disastrous effects of climate change have become evident. Sustainability as an aim, driven by anxiety about climate change, has truly become a global phenomenon. Consequently, environmental awareness and sustainability have entered the centre of discussion in the library world. Sustainability is usually defined so that it includes economy, environment and equality. Sustainable development should therefore take account of economic considerations (saving resources), but the development should also be environmentally conscious.

The construction of sustainable buildings, there are several actions that can be applied in the day-to-day operations of a library to reduce human impact on nature and promote sustainable development. It is extremely important that such actions become part of the daily life of any librarian, functioning as a starting point for environmental awareness and generating behavioural changes throughout the community.

2. Green Library and Sustainability

A green library is designed to minimize negative impact on the natural environment and maximize indoor environmental quality by means of careful site selection, use of natural construction materials and

biodegradable products, conservation of resources, and responsible waste disposal.

The term sustainable library building has been defined as the practice of creating structures and using processes environmentally responsible and resource efficient throughout a building's life cycle, from site selection to design, construction, operation, maintenance, renovation and reconstruction . Sustainability in this sense goes beyond designing a sustainable library building to introducing innovative library services and programmes as part of the on-going life cycle of offering transformative library services.

A frequently used definition of sustainability, from the United Nations World Commission on Environment and Development, is “to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs” (United Nations 1987).

3. Green Library Goals

The world today is experiencing a high rate of consumption as well as use of unhealthy products, processes and systems that are causing irreversible damage to the ecosystem, thus affecting the economy, community and individuals. This calls for the creation of radical measures to reduce such impact through the types of structures being constructed and human activities affecting ecology.

Objectives

- To know about green library initiatives and sustainability
- To analyse the importance of green libraries.
- To explain various techniques and methods for greening our libraries.

4. What makes a library green?

There is no all-encompassing; one size fits all, definition for the green library. There are many ways to define it, but there are a number of central themes that run through all of them, including, minimizing the negative impact the building will have on the local environment, and if possible having a positive impact. Reducing the use of water and energy by designing in a way that maximizes the use of natural and renewable resources. Integrating actual greenery and vegetation into the building and site design; preferably, using drought resistant and/or native vegetation. And, maintaining high standards of indoor air quality to help ensure the health of the people who inhabit the building.

5. Various Standards for Green Libraries:

- USGBC Standard
- Chicago Illinois Standards
- Brown Green Standard
- IGBC Indian Green Building Council Standard
- Green Rating for Integrated Habitat Assessment (GRIHA)

As per LEED(Leadership in Energy and Environmental Design) following are the green design elements

to judge a building sustainability..

5.1 Site location

- Use open space
- People should be able to reach the building
- Design to optimize sun, wind & light
- The heat island effect can be reduced by shading hard surfaces or by implementing a vegetative roof.

5.2 Materials

- Facilitate collection, separation and disposal of waste materials generated in the building.
- Recycled products can be unused papers, plastics, tyres of cars, broken furniture etc.

5.3 Water conservation

- Reduce Indoor Potable Water Use
- Reducing Water Consumption to Save Energy
- Using a tank we can store rainwater for reuse on-site, rather than allowing it *to* run off.

5.4 Energy efficiency

- The layout of the construction can be strategized so that natural light pours for additional warmth.
- Shading the roof with trees offers an eco-friendly alternative to air conditioning.
- Use of Solar power can be utilised in the library and energy can be saved.
- Natural light and energy-saving light-bulbs

5.5 Indoor air quality

- Ensure adequate ventilation
- Library buildings need to be designed in a way in which the air gets recycled and does not stay stagnant.
- Designate indoor spaces as smoke-free

6. Activities towards Green Library

- Management of waste by using most modern waste segregation and recycling practices. Waste can be turned into vermicomposting which can be used to increase the green cover in the surrounding area of library,
- Use of CFL lights instead of tube lights with proper maintenance to minimise expenses,
- Rain water harvesting pits can be created to store water and then it can be used for gardening,
- Use of maximum natural light and wind to save electricity,
- Digitisation of rare documents to save paper,
- Use of e-books and e-journals to save paper and place,
- Eco-friendly pesticides be used at the time of pest control,
- Turning off lights and fans in the library when not required,
- Using network printer instead of personal printers,
- Putting computers in sleep mode when these are in not use.

7. Some Important Green Library Projects in National and International Level and their features

7.1 Fayetteville Public Library

- Throughout the project, almost 99% of the construction waste was recycled or reused.
- By incorporating a green roof and using alternative roofing materials, the design team reduced heat island effect by as much as 20 degrees.
- Water collected on the roof is reused for landscape irrigation through an underground cistern, saving about 1,900,000 L of water a year.

7.2 Minneapolis Central Library

- A series of green roofs, advanced cooling and heating systems, and low-energy lights slash the library's energy use by nearly a third, making the building a lesson in how deep green design benefits everyone.
- Inside is a main lobby, where light scoops fill five open floors with natural illumination.

7.3 National Library, Singapore

- Eco-friendly building materials such as energy-efficient LED lighting, refurbished bookshelves and sustainable carpets were used.

- The visually-arresting centrepiece in the library is a tree house whose canopy is made from more than 3,000 recycled plastic bottles collected from the public.

7.4 University of California, Merced Kolligian Library

- 76% of construction waste diverted from landfill
- All materials are formaldehyde-free and low-VOC
- 42% reduction in indoor potable water use
- Insulated concrete shell provides thermal mass
- External shading devices limit heat gain while allowing views
- Photo sensors control interior perimeter lights

7.5 Anna Centenary Library

- Special care was taken to select sustainable materials – more than 60% are locally sourced and recyclable.
- Natural lighting is a key player in the design, as are large windows facing the north and east to provide the best light without introducing heat.
- Inside LED lights illuminate a huge indoor auditorium, cafeteria, and the many reading and research areas.

8. Libraries Role towards Sustainable Environment:

- A library should take into account the environmental impact of its building as well as its own activities and create an environmental strategy that defines the means and objectives of the environmental work
- A library can promote recycling and sharing in its own communities in different ways. The actual environmental effects of shared facilities, equipment and goods may not be significant, but the action raises environmental friendliness as a value and signals the importance of environmental issues to the community.
- The basic task of libraries is to ensure open and easy access to reliable and relevant information, which includes environmental information. A library should be active in this environmental work and environmental information can also be shared by non-written means, such as working together.
- The prerequisites for a community's environmental awareness are many common phenomena belonging to the area of sustainability. Literacy and critical literacy, information retrieval skills and the displayed information are such, with their promotion a natural task for libraries. More broadly, the improvement of equality and living conditions are prerequisites for the growth of environmental awareness in communities.

9. Suggestions

- Library can explore and promote the numerous practical issues where each individual can make a difference, e.g. in terms of using less paper (e-books, digital libraries, mobiles and tablets)
- Exploring opportunities in involving people to generate creative ideas on their own
- Identifying disciplines that Library need to participate in “green library” initiatives.
- Exploring means of sharing ideas on “green library”,
- Displaying relevant information on “green library” available in books, videos, etc. through every possible means – be that home pages in library websites or notice board.
- Promoting scholarly research, especially with regard to the role of Library,
- Raising awareness of organisations working on various issues concerning environmentally friendly and sustainable libraries.

10. Conclusion

The environmental debate has evolved. The fact that humans are having a negative impact on the environment is no longer seriously questioned.. Libraries play an important role in the society, and therefore also in the environmental world. Library has to take a clear stand and create a visible green image for the library. New ideas and ideals cannot be spread if one remains silent. Silence does not promote the status and survival of libraries in a quickly changing world. Everyone should realize that, in libraries, we work for a better future.

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A Proposed Model for Ideal Library Services to Disable Users

Avijit Halder

M.Phil Student

Department of Library and Information Science, Jadavpur University

E- Mail:avijithalder1947@gmail.com

Dr. Subrna Kumar Das

Professor & Head

Department of Library and Information Science, Jadavpur University

E- mail:skd_ju2002@yahoo.co.in

***Abstract:** Library is an academic temple, which services the society without any favouritism between them. It may be public, academic or special but the main purpose is to facilitate the entire community in enhancing their intellectual capability. Here the community have been categories various cast, religion (apparently we think of doctrine as religion), gender but library never discriminates specially abled users, whereas they deserve the same opportunity. According to Article 26, Universal Declaration of Human Rights, 1946, “Everyone has the right to education. The focus of this article is how an ideal library service can be personalized to the specially abled users”.*

***Keywords:** Cognitive Disabilities Users; Deaf and dumb Disabilities Users; Divyangian; Psychologically incapacitated users; Visual Disabilities Users.*

0. Introduction:

The novel words “Divyangjan” is coined by our Prime Minister Mr. Narendra Modi (WeCapable, 2019). The word is used to specially abled persons who are called ‘bikalang’; scholar society are called ‘physical challenger’ and highly scholar society are called ‘special challenger’. It’s a Hindi word, means ‘divine body’.

Since some social activists considered this term as somewhat derogatory to such persons who have some talent or other, and intervention by facilitators started showing such persons to above average in intelligence and also found to possess compensatory talents, the new term ‘specially abled’ has been adopted (Radhakrishnan, 2018).

Libraries are basically aid providing intuitions’ that gives services to all without any kind of distinction, exclusion to its various users which also include specially able users. University Grant Commission (UGC) in its circular dated on 9th January 2009 has mentioned:

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1. “धर्म सबाई बाँचे बाडे, सम्प्रदायटा धर्म नारे। धर्म जीवन दीणु रय, धर्म जानिस एकई हय”। ठाकुर अनुकुल चन्द्र।
 2. In Mann Ki Baat radio program, on 27 December 2015, the Indian Prime Minister said that instead of viklang, a new word divyang should be used to refer to persons with disabilities.

- ❖ To provide facilities to persons with disabilities;
- ❖ To strictly follow the Persons with Disabilities Act, 1995 (PwDs Act, 1995);
- ❖ To make the provision of university library services for specially abled users;
- ❖ To take steps to make the institution barrier free.

IFLA Standing Committee of Libraries Serving Disadvantaged Persons (LSDP) has devised a practical tool for all types of libraries (Irvall & Nielsen, 2005):

- ❖ To access existing levels of accessibility to buildings, services, resources and programmes.
- ❖ To enhance accessibility where needed.

1. The Nature of Disabilities:

In the general view a man can see with eyes, hear with ears, perform works with hands, speak with tongue and makes decision with brain. Oversight of one or more organs leads to disability, that may be cognitive, intellectual, mental, physical or some others. Disabilities can be broadly classified as follows (Disabled World, 2019):

- ❖ Cognitive
- ❖ Deaf and dumb
- ❖ Visual

1.1. The most valuable scheme to provide information to patrons with specially abled:

The library should offer guided voyages through the library gatherings of people with exceptional necessities. Considerable supporters may experience issues erudition data about the library. The data about access, administrations, materials and projects ought to in this manner be accessible in the elective configurations recorded below:

1.1.1. Library Services for Cognitive Disabilities Users:

To provide a well quality services to these types of users library should following special resources along with conventional resources (Solanki & Mandaliya, 2016)

- ❖ Audio books;
- ❖ Books in enlarged print;
- ❖ Illustrated resources (like Pictorial books);
- ❖ Jelly bean;
- ❖ Touch screen, or, screen reader;
- ❖ Voice input and output devices; etc.

1.1.2. Library Services for Deaf and dumb Disabilities Users:

To provide a well quality services to these types of users library should following special resources along with conventional resources (Das, 2019):

- ❖ Easy-to-read text for users who born deaf or became deaf before;
- ❖ Resources in displaying videos;
- ❖ Resources in sign language;
- ❖ Resources in subtitled or potentially gesture based communication recording;
- ❖ Resources through library's accessible website with audio information should also be available as text form;
- ❖ Resources through text telephones and others medias; etc.

1.1.3. **Library Services for Visual Disabilities Users:**

To provide a well quality services to these types of users library should following special resources along with conventional resources (Babalola, & Haliso, 2011):

- ❖ Braille and other tactile resources;
- ❖ Computer files of text;
- ❖ Information on the library's available site.
- ❖ Large font books for low vision users;
- ❖ Resources in extensive print;
- ❖ Resources on sound type, CD or, DVD;
- ❖ Taking books, audio serials; etc.

1.2. **For psychologically incapacitated users:**

To provide a well quality services to these types of users library should following special resources along with conventional resources:

- ❖ Information in a sample to peruse position;
- ❖ Information on sound, or, video tape, CD/DVD;
- ❖ Information on the library's available site; etc.

2. **Barrier frees Building of a Library Building:**

User with specially abled should be able to turn up at the site, approach the library building and enter easily and safely. If the main entrance cannot be made accessible, a secondary accessible entrance should be provided, equipped with automatic door opener and a ramp¹.

So, library building plays a vital role. Library building should be set-up in such a fashion; so that nobody should have any difficulty either to access library resources or services. In other words it may be said that library should be constructed in barrier free manner. Some of those are follows:

¹ Planning barrier free libraries : A guide for renovation and construction of libraries serving blind and physically handicapped readers. Washington : National Library Service for the Blind and Physically Handicapped, The Library of Congress.

- ❖ Accessible car parking
- ❖ Accessible toilet
- ❖ Anti-skid floor
- ❖ Automatic door opener
- ❖ Escalator
- ❖ Hard rails
- ❖ Ramp
- ❖ Signage
- ❖ Spacious entrance and corridor

3. Components of Comprehensive Library:

Earlier than to plan for build one comprehensive library one has to know the common components or elements of the comprehensive library (Grassi, 2012):

- 3.1. Library professionals** – professionals at all levels create a friendly and welcoming atmosphere for users with specially abled.
- 3.2. Library Building Design** – all areas of building and library property are compliant with the most recent standards designed by any National or International agency.
- 3.3. Library Spaces** – washroom, furniture & fittings, drinking fountains, conference room and audience rooms are well accessible to someone with special needs. The bookshelves are wide and info desks are low adequate to help out users with wheelchairs.
- 3.4. Signage** – well readable font or Braille translation are used on signs to indicate different areas and library collections; accessible buttons for doors and elevators are available.
- 3.5. Supportive Equipment** – access to hand held magnifiers, screen readers to make more accessible. Digital keyboard and mouse for using computer stations; wheelchairs for in-house user usage.
- 3.6. Accessible Devices** – circulating iPads and eReaders allow users to have access to e- content.
- 3.7. Alternative Formats and Collections** – well readable type print, audio-visual, Braille, DVDs, adapted or other materials in special needs specific collection are available for users to check out.
- 3.8. Publicity** – home deliveries are available for users that have limited mobility; guided in-house and web-based tours for those that need additional assistance exploring the library.
- 3.9. Services and Communication** – text or reference materials available for users who want to utilize the services of library from home, priority seating given to users using wheelchairs, disability awareness training for professionals helps provide more information.

4. Conclusion:

The library must be equally accessible to all users' of all categories. So, it will ensemble the environment and resources of the library, which is the aphorism of an ideal library.

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Digitization and Digital Preservation in modern libraries-Processes and challenges

Ms. Sasmita Patra

Assistant Librarian, KIIT Deemed to be University, Odisha,
sasmitalib@gmail.com

Dr. Jyotshna Sahoo

Associate Professor,
DLIS, Khallikote University, Berhampur, Odisha

***Abstract:** Archival of the traditional library materials becomes more effective through digitization. Digital Preservation makes the materials more usable with pertaining risk factor of careful handling or storage, which can be better accessed by our future generation. This paper narrates about digital preservation in libraries with the processes followed up and the challenges faced by the library personnel at the time of attaining the same. Digital preservation not only helps the users but also reduces the workload of physical handling of material and saves the time and energy of the library staff.*

***Key words:** Digital preservation, Digital archive, ICT, Metadata*

1. Introduction – Libraries are the store house of knowledge in the form of records, books or other rare materials which constitutes human heritage. For the conservation and preservation of such materials various types of professionals are indulged all over the world. Specially librarians and archivists play major role. During the last two decade, the library professionals are trying the preserve the world of knowledge through digitization. With the digital objects now we can create, communicate and exchange our valuable information. As the users now demand for round o'clock information services so as the information professionals even ready to provide that through the help of information and communication technology (ICT). Digitization and digital preservation can be considered as a suitable weapon for the library professionals in handling, preserving and disseminating the knowledge resources.

2. Digitization

Digitization is a word, which is used with variety of connotations and denotations in present day. Digitization means acquiring, converting, storing and providing information in a computer format that is standardized, organized and available on demand from common systems. This process primarily involves changing analog information into a digital form which helps the end user to access easily and extends own usability and durability. Now this activity comes within the library's routine activity other than an isolated functioning.

The main aim of libraries is to collect and preserve material for the browse of information seekers. Libraries are now collecting a vast of information from various reliable sources and preserving them

in digital form by using advance technology, so that the information can be stored for a long period of time and can be used by a huge mass at the same time. Digitization helps to save the time, energy, space, money and many more.

3. Digital Preservation

Digital Preservation is the management and maintenance of digital objects (reformatted or born digital) for future access and use. Other than the print objects the digital objects have a very short life span, i.e the computer containing all your data may crash at any time, hence before it became too late, we should think about the preservation of digital objects. Digital preservation is needed not only for personal data management but also large repositories that manage many objects.

According to Harrod's Librarian Glossary " Digital Preservation is the method of keeping digital material alive so that they remain usable as technological advances render original hardware and software specification obsolete."

4. Literature Review

The increasing demand of the users for round o'clock service makes the librarians offer digitized service (Guenther ,2000). The range of service extends in the modern libraries such as effective study space, licensed digitized material, management of digital repositories etc. creates an efficient librarian (Campbell, 2006). Wawrzaszek (2008) pointed out that the libraries must be come into force for making a changeover of their traditional journey in the digital environment. Libraries are now drastically changing through the adoption of new technology in various forms of their activities by a paradigm shift of focus from physical to digital formats (Choi & Rasmussen, 2009). By applying new technologies, the library services for creation, dissemination and preservation of the digital material goes in a cyclic way (IFLA,2010). If there are no pre-existing digital preservation systems that could be used as templates, outsourcing advantage can be taken as of the vendor's experience in managing large sets of data and load balancing (Oliver,2015). Convergence can provide an opportunity to the 21st century libraries for their inter connection in the purpose of sharing and preserving knowledge and cultural heritage. Regarding the convergence strategies copying and quality assurance are highlighted by (Brown,2016). Though more than 70% of the AIR media libraries are preserving their digital collections but there is a requirement of proper planning, policies and have to find out new tools and techniques for the enhancement of library services (Sarojadevi, K,2016). The policy development is the foremost step for preservation activities and which can ensure for the long-term preservation actions (Adjei ,2019).For better preservation it needs to concentrate on funding, staffing, management support, getting external expertise in preservation activities and let the staffs involved in digital preservation work to attend conferences or workshops held on the digitization and digital preservation (Masenya,2019).

5. Why digital preservation in libraries?

The following objectives can be achieved by digital preservation such as:

- To make accessible to the rapid growth of digital information.
- To able the users to reach out digital documents in simplest form as there is complexity is found with digital objects and they are totally of software dependent.
- Users will not bother about the continuous flow of change of technology.
- By a widely accepted format or standard information can be accessible over a long period of

time.

- To ensure the persistence of the digitized material.
- To get rid of the fast change of storage media.
- The resources can be stored and accessed with collaborate of various institutions.
- The authenticity of the digitized material can be protected.
- Can bring attention of the archivists.
- The cost and effort of handling physical materials can be reduced.

6. Process of Digital Preservation

To carry out digital preservation activity in the library, the librarian has to undergo certain procedures. Every step starting from selection of the material for digitization up to its long-term storage the knowledge, experience, efficiency and managing effort of the librarian plays a vital role. Each stage puts own importance for proper digitization and digital preservation of the documents.

6.1 Selection of the material for digitization: At the time of selecting materials for digitization, the selection committee or the librarian has to apply selection criteria principles i.e. the priority on the basis of the demand of the users, value of the material, having permission from the owner of the thought content, and the most important thing is the condition of the material.

6.2 Digitization of the images: Through this process the images are captured by means of scanners or digital cameras then indexing and storage is done. The storage may be made in optical disk or server. DIP even can be done by using networking allowing several users. The final output of the document image processing is adaptable in electronic format.

6.3 Electronic Filing System: The digitized files are stored with different file extension formats like jpeg, pdf, tiff etc. OCR (Optical Character Recognition) is used to turn the digitized documents into electronically encoded text. This allows to index the documents with proper file names and make them able for easy retrieval. Now the scanners are coming with OCR software built in.

6.4 Management of the document and making accessible: In this stage the documents are managed and stored by the help of different software. Many document management systems are able to keep track, access, download and in some cases edit the preserved data. The digitized documents can be stored in different digital formats like USB drive, CDs/DVDs, hard drive, server etc. Digital document management system can retrieve files more efficiently and also can give protection against viruses.

6.5 Storing the digitized documents: To store the digitized documents, the institutional server may be the first priority but for optimum security and protection, outsourcing of them is the next option. With data protection legislation data can be securely managed and faced audit.

For continuous and reliable access, the digital preservation work has to undergo with various actions and interferences. This encloses not only technical activities but also the support of the management and other vital considerations which relates to the maintenance of the digital material. The digital materials must have guarantee of originality, cohesion and storage independent.

7. Principles of digital preservation

- To accommodate critical assessments for the digital collections to put into the decision of digital

preservation for which technical activities will support the same.

- Proper metadata need to be preserved to make the document easy for interpretation over time.
- The content of the digital collection so preserved can exhibit its authenticity in future.
- The modifications on the digitized document must be recorded to maintain the integrity over time.
- The metadata standards must be documented for which it will be easy for the future generations to understand that.
- With file level integrity the data can be protected against any loss or damage.
- The original files should be preserved for long term archival.
- A preservation plan needs to be followed up for comprehension understanding of the digital collections.
- A regular maintenance of the digital document should be implemented so that it can be consistently managed on entire lifecycle.
- The quality assurance checks should be blended with the digital contents.

8. Issues and Challenges for digitization and digital preservation

8.1 Fragility of Media: The preserved digital materials are unstable and can go towards deterioration easily, if not suitably stored and properly maintained even though it may not seem as damaged. The server needs excess amount of cooling to function, in the absence of which massive data may loss.

8.2 Intellectual Property Rights: The greatest challenge other than technology to preserve data digitally is copyright issues. Sometimes there is provision of using only a small portion of the work rather than the total creative work. To take specific permission might be very challenging for digital archive.

8.3 Lack of high-level management support: Getting the management support and taking suggestions from archival experts is the key in reaching at the challenges for digital preservation (Rinehart,2014). The management should help in preparing clear policies, maintenance of standards and training for staff etc.

8.4 Archivability: Due to the security classification or cultural sensitivity, some documents could not be preserved (Driscoll,2006). Some materials may become irrelevant in the time passed by and the cost, time and efforts become wasted for preserving them (Lavoie,2004). So it presents a great challenge to determine what to preserve.

8.5 Storage in multiple locations: Most of the time same document is preserved in multiple locations with different file formats. In that situation, it becomes very hard to know which is the original file. As the files are stored in different location, the changes occurred to one file will not be applicable for the files of other repositories.

8.6 Obsolescence of hardware and software: Hardware in which data is stored digitally may damage by negligence or for inappropriate storage. The care for the digital media also sets a challenge. Now many institutions are depending on outsourcing for archival of their document but if the third party will go out of business, then risk emerges for the preserved data. And also, by the rapid development of software and the operating system based on may bring issues for digital preservation. The code used in the current age may change in future will bring difficulty to port the software. For lack of support of

software, the preserved data may not be accessible in future

8.7 Proper funding: A special grant is needed for carrying out digital preservation activities. Not only at the initial stage but also in every part of digital life the cost is calculated. Cost for necessary infrastructure, for procurement, for labour charges, for training of the staffs involved, for outsourcing, for long term access is required to add in the library budget.

8.8 Staff and skill: The issues relating to staffing and skill are -though there is provision of training for staff in some places, it is only theoretical in nature which lacks best practice in practical field. Different skills are required in different stages of the preservation procedure. Particular professional category such as archivists and record managers need to be appointed. The staffs engaged in preservation work require training to adopt new technology and skills for active career development.

9. Future Prospects for digital preservation in libraries

As many organisations are using different file formats, a proactive and ascendable approach needs to be followed for making the digital information accessible in supported format. To preserve data, cloud will be considered as the safest place. There is also need of combining digital preservation software with cloud for creating an enduring, storage setting. Many consortiums need to be formed to take important steps in the field of digital preservation by creating suitable models for the representative institutions. Some of the important consortiums in India are-INDEST, UGC-INFONET, CSIR, FORSA etc. The service providers like libraries, museums, archival institutes will concentrate on the practical implications of the digital preservation. Specialists will work on the solutions needed for preserving specific type of digital material. To sort out the problem of longevity of the digital material research needs to be carried out.

10. Conclusion

The recent information and communication technology put potentiality for the growth of global knowledge centers and increase opportunities for library professions to provide as faster and better services as possible. The digital uprising has effectively changed the role of 21st century libraries and meet the raised expectations of different user groups. The library personnel face many challenges in order to make the digital domain accessible in future for organizing and representing the same context of information with their digital perspective. The nature of the user community, their knowledge base covering perception and interpretation of a definite content may change over the time period. Hence the library has to monitor such expected changes and create the digital environment in such a way that the user community can study that particular content after long decades ahead without any difficulty.

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Controversies around Article 15 and 17 of European Union's Copyright Directive 2019: A study

Sandip Majumdar

Assistant Professor, Dept. of Library and Information Science, University of Gour Banga

E-mail: times_sandip@yahoo.com

***Abstract:** The present paper endeavours to give a critical account of the controversy around Article 15 and 17 of the Directive 2019 on revision of European Union's almost two decade old copyright laws which have been modified to address issues that are arising out of presence of online social networking and content sharing platforms and activities in consequence of mass participation of common people together with new profitable business model that has been employed by these platforms to generate revenues at the cost of original content creators. Views and opinions of stakeholders have been discussed to understand implications of the Articles. A brief historical background and contents of the Directive have also been touched upon. The paper concludes with Indian perspective on the subject matter.*

***Keywords:** Copyright; Content creator; News media; European Union; social media platform; Directive Access to information in digital age; IPR and copyright issue.*

1. Introduction

The advent of high speed internet connectivity and its access through mobile devices such as smartphone, tablet has redefined our perception toward digital space, commonly known as World Wide Web (www). With the falling price of internet enabled devices in one hand and superior technology of those devices on the other empowers common people to be a part of this digital revolution. Suddenly, a vast virtual space has been opened up for people where they can interact with others; comment; upload and share photos, videos, and documents irrespective of geographical location; participate in discussion forums; thanks to the online social networking and content sharing platforms such as Facebook, Twitter, Instagram, Youtube, Whatsapp, etc. The addictive nature of these platforms has opened up two avenues- one avenue leads to people frequently uploading and sharing contents, a considerable part of which may come under copyright protection. The other avenue witnessed a profitable online business model wherein online social networking platforms are generating millions of dollar revenue by hosting copyright protected creative contents as royalty free contents most of the times by virtue of acceptance of terms, conditions, and privacy issues as outlined by such online social networking platforms on the part of users prior to uploading contents to these platforms. This has created imbalance between genuine creators and the revenue harvesters who are hosting the contents. The effort considered to be a positive step towards balancing the situation and prevent monopoly by internet giants like Google, Facebook, Apple Inc., etc.,

is the revision of European Union Copyright Rules in the context of European Union. This paper aligns its discussion in the line of the above thought. The European Union (EU) Copyright Act came into force on June 7, 2019.

2. Historical background

Directive (EU) 2019/790 of the European Parliament and of the Council of 17 April 2019 on copyright and related rights in the Digital Single Market and amending Directives 96/9/EC and 2001/29/EC (Text with EEA relevance.),¹ an outcome of long drawn legislative initiative that started with introduction of proposed draft of the Directive by European Commission, is considered to be revision of existing European Union Copyright Law to suit internet environment and a component of the European Union's Digital Single Market Project. In fact, in year 2001, for the first time the European Union (EU) attempted to unify copyrights in light of digital technologies through adopting Information Society Directive 2001/29/EC² Ultimately European Commission proposed draft of the Directive on 14 September, 2016 and after much debate and deliberation, triologue negotiations (among European Commission, European Parliament and European Council) resulted into approval of the Directive by European Parliament³ with 348 vote in favour, 274 against, and 36 abstentions. The member states would have 24 months for incorporating the Directive into their national legislation.

3. Brief structure of the Directive

The Official Journal of the European Union published the Directive on May 17th, 2019² and is said to be extending provisions in the rules laid down in earlier Directives particularly Directive 96/9/EC, 2000/31/EC, 2001/29/EC, 2006/115/EC, 2009/24/EC, 2012/28/EU and 2014/26/EU of the European Parliament and of the Council. The unit of the Directive is Article and comprises a total of 32 articles enlisted under five Titles namely Title I (General Provisions), Title II (Measures to adapt exceptions and limitations to the digital and cross-border environment), Title III (Measures to improve licensing practices and ensure wider access to content), Title IV (Measures to achieve a well-functioning marketplace for copyright), and Title V (Final provisions). Article 1-2, 3-7, 8-14, 15-23, and 24-32 were accommodated in Title I, II, III, IV, and V respectively. Articles in Title III and Title IV were recorded under four and three Chapters respectively.

4. The controversy

The most controversial part of the Directive deals with Article 15 (known as ex-Article 11) and Article 17 (known as ex-Article 13). Since the introduction of draft Directive by European Commission, these two articles have been in the limelight and subjected to fierce debate among stakeholders of European Union together with intense lobbying by internet giants such as Google, Facebook, Apple Inc., etc. and seem to be a never ending controversy with opinions for and against the Articles. So much so that these Articles divided stakeholders into two groups-on one hand there are right holders and on the other online content sharing platforms together with common users.⁴ Article 15 has direct effect on the modus operandi of news aggregating platforms such as Google News and Facebook as the Article advocates for protection of interests of news agencies and individuals by suggesting fair compensation for dissemination of their news and stories online. In other words, the Article empowers press publishers to seek remuneration from online news aggregating platforms for reposting through mechanism of license agreement. It may be mentioned here that Google News and other news aggregating platforms generate revenue to the tune of millions of dollar by hosting news and advertisement. So much so the heartburn that Google once announced to avoid signing license agreement with press publishers by only displaying a portion of the text necessary to comply with the EU's copyright directive as the Directive exempted uses of individual

words, acts of hyperlinking, and very short extracts of press publications, also referred to as snippets⁵. But the ripple effect of Article 15 might have reached US shore as New York Times in its August 8, 2019 edition⁶ reported a new media initiative by Facebook to sign contracts with some of the largest American news publishers such as the New York Times, the Washington Post, and Dow Jones whereby Facebook will be able to pull in headlines and previews of news articles from signee news publishers and display the same inside a 'News' tab in Facebook mobile app and if finalised, the deal could worth millions of dollars. Eventually, Facebook, as reported by the New York Times⁷, launched Facebook News on October 25, 2019. Article 15, for the reason as stated above, is also referred to as a "link tax", "news tax" or "publishers' right" which aims to generate income for European press publishers⁸.

With Article 17 of the Directive, online content sharing service providers are no more considered to be passive host but to be held liable for copyright infringement for presence of copy-right protected contents on their platforms. These service providers are to obtain authorisation from rightholders by way of licensing agreement for giving public access to copy-right protected works and adequate measures must be put in place to filter out unauthorised uploading of such kind of works by users on their platforms. Here lies the apple of discord as traceability of original creator in online environment is no less than a herculean task. This restriction could potentially lead to heavy revenue loss on the part of online content sharing platforms and at the same time freedom of access to online contents could severely be jeopardised. Moreover, internet giants can afford to develop and deploy effective filtering software (such as Youtube's ContentID⁹) which is not the case with start-ups. Anticipating this, the Article proposed controlled exemption of content sharing service providers of less than three years old with a visitor base not exceeding five million and have an annual turnover below €10 million. Also, quotations, criticisms, reviews for the purpose of caricature, parody or pastiche are kept outside the restriction.

5. Indian scenario

In India, a large number of users of popular social networking platforms being first generation users of smartphone and 4G mobile technology, are unlikely aware of ins and outs of copyright provisions and privacy issues applicable in Indian subcontinent. The lure of these social media platforms is so overwhelming that people rarely go through the terms and conditions of subscription to these media¹⁰ and knowingly or unknowingly share, post, and upload creative contents and news that may come under copyright purview and original creators remain unpaid. The terms of service of Facebook¹¹ in this regard may be quoted as: "Specifically, when you share, post or upload content that is covered by intellectual property rights on or in connection with our Products, you grant us a non-exclusive, transferable, sub-licensable, royalty-free and worldwide licence to host, use, distribute, modify, run, copy, publicly perform or display, translate and create derivative works of your content." Such kind of agreement empowers these internet giants to monopolize online platform business model and generate revenue to the tune of millions of dollars while keeping the original content creators deprived. Given the recent developments in copyright arena of Europe and United States, Government intellectual property right body and other stakeholders such as libraries, museums, achieves, higher educational institutions and news agencies may form a common forum to address the issue so that a balance could be achieved between content creators and online host platforms in the light of the Copyright Rules, 2013 and its amendments, 2019.

6. Conclusion

Intellectual Property Rights must create a level playing field for content creators, content aggregators, and consumers of information in its various forms, so that society may thrive and remain a place for creative minds.

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Digital India and Digital Divide: role of Library & Information Centers in the 21st Century

Partha Chattopadhyay

Librarian, Hiralal Bhakat College, Nalhati, Birbhum, West Bengal

Email id:-chattopadhyaypartha224@gmail.com

***Abstract:** The society has been changing very rapidly with the help of modern Information & communication Technology(ICT). On the other hand the ICT divides the society into two parts. They are the people who have the access to information and those who do not. This is happened in all developed as well as developing countries. This discrepancy is also found in our country also. Through this paper the different aspects of digital divide in India are discussed and at the same time the different initiatives from the end of the governments are also described as far as possible. The most notable point is that Library can play a very crucial function to bridge the gap of digital divide and make the people of society more informed about the various initiatives of the governments so that libraries can exist by ignoring the threat of sustainability in the digitized environment.*

Keywords: ICT; Digital Divide; Digital India; LIS

1.Introduction:

The Information & Communication Technology(ICT) has brought a tremendous change in the performances of our daily life such as shopping for necessities, education, business transaction, banking, recreation etc. By virtue of the ICT we are now living in a digitally empowered society. In this digital age some individuals, households, business and geographical areas at different socio- economic levels with regards both to their opportunities to access ICTs and to their use of the internet for a wide variety of activities. This is due to various reasons such as lack of necessary computer and internet skills and also lack of command over English language proficiency that hinder expansion and use of digital information resources etc. So, there must be a gap in between these two categories. This lead to coin the term “Digital Divide” which was uttered by a former United States Assistant secretary for commerce for telecommunication, Larry Irving, Jr.

2.Methodology, Scope and Objective:

The literature search method is being followed here to collect the data. The scope of this paper is limited only in the Indian perspective. The objective of this paper is to depict the various aspect of Digital India and Digital Divide in India. There are so many initiatives which have already been taken from end of the Government(s) to cope up with the digital divide. The role of Libraries is very positive in bridging the gap of digital divide by giving probable solutions through this paper.

3. Indian Scenario:

“Digital Divide” exists both in the developed and developing countries. But the situation is something

like different in India. India is a multicultural, multilingual and multi religion country with complex socio-economic diversity. The total population of India can be categorized into three main categories such as urban, semi-urban and rural localities. As far as India is concerned the following factors can be considered as barriers to the digital divide:--

3.1 Low Literacy Rate:According to the census of India,2011 it is found that the Literacy rate of India has shown improvement of almost 9.2%. It has gone up to 74.04% in 2011 from 65.38% in 2001. It is also found that male literacy rate is 82.14% while female literacy rate is 65.46%. The uneven distribution of literacy rate reveals that there is a difference in the literacy rate which in turn creates a hurdle for digital divide. Among all states the highest literacy rate is found in Kerala followed by Lakshadweep and Mizoram.

3.2 Poverty Line:The socio economic condition in India is a great handicap in case of Digital Divide. The Sachar Committee looked at the Poverty by social and religious classes. The annual report of the year 2012 of the RBI revealed that the state GOA of having the least poverty of 5.09% while the national average stood at21.92%. The following is the table shows the picture of poverty condition of India at a glance.

Social and Religious Class	Percentage of Living in Poverty
Urban Hindus	20.4
Urban Hindu General	8.3
Urban Hindu OBC	25.1
Urban Hindu SC/ST	36.4
Urban Muslims	38.4
Urban Other Minorities	12.2
Rural Hindus	22.6
Rural Hindu General	9.0
Rural Hindu OBC	19.5
Rural Hindu SC/ST	34.8
Rural Muslims	26.9
Rural Other Minorities	14.3

3.3 Education System: The number of dropouts at the under graduate level is the biggest challenge being faced by the Indian education system. It is to be noted that according to the statistics approximately 23 million children per year take up primary education but only about 15 million children per year take up secondary education.

3.4Language: A large percentage of information content available on internet is in English language. In India people are accustomed to communicate with their regional or local languages which create a cause for Digital Divide.

3.5Infrastructure: Lack of sufficient telecommunication infrastructure with sufficient bandwidth for internet connection in India is a barrier to access ICT.

3.6Empowerment of civil society: Structural, political and governance factors do not impede equal enjoyment of the benefits of the ICT.

3.7 Attitude: Lack of attitude to learn the newly emerged technology among the masses is another

reason for Digital Divide in our country. This is due to generation gap. Young generation are easy to use the ICT rather than that of the others.

4. Digital India Program:

“Digital India” is a program to transform India into a digitally empowered society and knowledge economy. It was inaugurated by the honorable Prime Minister Narendra Modi on 1st July 2015. The vision of Digital India is to create digital infrastructure as a utility to serve every citizen, promotion of governance & services on demand and digital empowerment of citizens. This earmarked program is based on nine pillars. These are broadband highways, universal access to phones, public internet access program, e-governance, e-kranti, information for all, electronics manufacturing, IT for jobs and early harvest programs. The overall costs of Digital India are estimated as Rs 100,000cr in ongoing schemes and Rs 13,000cr for new schemes & activities. The impact of Digital India by 2019 are as broadband in 2.5 lakh villages, universal phone connectivity, 400,000 public internet access points, huge job creation and wi fi in 2.5 lakh schools, all universities and public wi fi hotspots for citizens etc. It aims to bridge the gap between the digital haves and have-nots by using technology for citizen.

5. Initiatives from the end of Governments:

Both the Central as well as different state governments are trying their best to promote Digital India mission successful. Different state governments have started different portal for e-governance. The Government of India has taken steps to improve literacy rate in India. These are free education program to the poor people living in villages and towns; BetiBachao&BetiPadhao to save and educate the girl child in India and introduce Literacy campaigns at several times to conduct door to door survey to examine overall literacy scenario in the districts of India. Some of the other notable initiatives are Kissan Call Center which was created on January 21,2004 to deliver services to the farming community of India The purpose is to respond the issues raised by farmers instantly in the local languages. Another one is the Life Line India. It was created in November 2006 to enable farmers to record a question and after that get a recorded reply. Beside these other important initiatives are Gyandoot Project and TDIL(Technology Development for Indian Languages). The Gyandoot is an internet in Dhar district connecting cyber cafes catering to the everyday needs of the masses. The department of Information Technology initiated the TDIL with the aim of developing information processing tools and techniques to facilitate human-machine interaction without language barrier creating and accessing multilingual knowledge resources and integrating them to develop innovative user products.

6. Initiatives in the field of Library Sectors:

The Library sectors are not lagging behind for bridging the gap of Digital Divide. The Muktabodha Library Project was begun in 1995 to digitize the manuscripts. Another one is the Digital Library of India to promote the access of digital resources by the user community. Consortium movement was started for resource sharing by using ICT among the academicians. UGC- INFONET is one of them. There exists other consortia also. The very objective is to create a culture of using more and more e-resources among the users. INFLIBNET is doing a great job by creating Sodhganga, Sodhgongotri projects for accessing full text PhD theses submitted by the scholars in Indian universities and suggesting new scholars to consult with the research in progress respectively. These certainly help to avoid the duplication of research and also lead to the qualitative research at the same time. NLIST, a project of INFLIBNET is a package of e-resources for the college community of our country. The National Digital Library created by IIT(Indian Institute of Technology) Kharagpur with the assistance of MHRD(Ministry of Human Resource Development) to use the e-resources available in different formats and in different languages

to all free of cost. To create the e-learning platform the MHRD, Govt. of India has created SWAYAM platform. This is an interactive one. SWAYAM PRABHA is created by using the satellite technology for delivering qualitative lecture by the eminent teachers of reputed academic institutions of our country.

6.1 Role of LIS Professionals in Digital Divide:- There are a large number of academic, public and special libraries in our country. School, college and university libraries belong to the academic library. The LIS professionals working in such academic libraries must teach their user community about different useful portals, links and web based study materials to create digital literacy and inculcate a habit of e-culture among the user community.

In our country there is a chain of public libraries scattered in different states to promote mass education, eradication of illiteracy and to support both formal and informal education irrespective of caste, creed and sex. Being the peoples' university public libraries can play a crucial role in this digital environment. Internet connections and other equipment can be provided to the users on subsidy basis and the public should be allowed to use them by becoming members of these libraries. They need to move beyond their traditional domains and promote e-culture on a massive scale by using various social media platforms easily.

Special libraries deal with the special type of users and they should decorate their products and services according to needs of their customers in this digital age.

7. Conclusion:

The revolutionary evolution of ICT raise a question of sustainability before Library sectors more seriously. We have to be remembered that digital technology is not a threat to us but it is to be taken as a bliss because these will help us to recreate new decoration, new products and new customized services to attract the new users day by day. This will give more opportunity to teach our society efficiently just like a good leader. A good library can provide a good civilized society which can fight against the Digital Divide and make successful the Digital India mission into a right direction in future.

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Preservation and Conservation Work in College Libraries in West Bengal: A Study

Payel Sarkar

Student, MLIS, Netaji Subhas Open University

Email: sspayel13@gamil.com

Dr. Swapan Khan

Librarian (Evening Shift), Narasinha Dutt College, Howrah, West Bengal

Email: khanswapan@gmail.com

Abstract: *To find out the present situation of preservation and conservation work in college libraries in West Bengal, 60 libraries have been selected. It shows 98.33% of libraries use cleaning and dusting in a regular basis, 90% take measures by binding the old books. 85% libraries have security instruments and 71.66% of libraries have photocopy machines. It finds libraries (66.66%) having scanner machine. A considerable number of libraries take digital library initiative. Most of the libraries (60%) agreed with inadequate funding for preservation and conservation work.*

Keywords: *Preservation; conservation; library books; dusting and cleaning; document management*

1. Introduction

Among the essential missions of libraries, two are complementary: preservation and access. Preserving for the sake of preserving is useless and giving access lavishly to all documents without taking into account preservation measures will, sooner or later, lead towards making the documentary heritage inaccessible for future generations. Conservation and restoration are the most central activities of preservation. They are concerned with the physical maintenance and repair of documentary materials.

The study investigated the various techniques used in the preservation and conservation of library materials in selected college library in West Bengal. Particularly, it examined the total collection of library materials and number of their different physical forms, preservation and conservation polices and constraints limiting effective preservation and conservation.

Preservation and conservation work by college libraries is not a new issue to the library professionals. There are lots of works about it before done around the world. Some of them are Baker and Soroka (1978) asking “way preservation?” and gives some values of the nature of library materials; causes of deterioration; the role of the librarian; the roles of the conservator and the scientist; binding; manuscripts and documents; preservation; micro recording and other copying methods; disaster and salvage; and National planning. A Symposium on the preservation of library and archival materials in Southern Africa was held at the South African Library to promote awareness amongst information workers of the urgent

need to conserve and preserve the Southern African literary heritage (Meyer, 1987). In the year of 2019, two authors concluded a study for the preservation and utilization of the former house and calligraphies, books, and other materials. But the main project was restricted to the relocation of the former house because of fund shortage. Another study was conducted on preservation and conservation in the library (Yajima & Sugawara, 2019).

Present study focuses on the preservation of library materials in present day. It has been tried to reveal the present situation of the college libraries regarding preservation and conservation of library materials.

2. Objectives

The Objectives of this study are as follows:

- To identify college libraries in West Bengal present conditions about their collections.
- To find out the role of different types of college libraries to preserve those information.
- To know the tools for preserving documents in the college libraries.
- To find out the problems of those college libraries regarding collections.
- Preservation and Conservation polices of those colleges.
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3. Methodologies

The present study has been conducted on the basis of online survey i.e. taking information from websites of those colleges. Some of the cases phone calls, email and social networks have been used for data collections. At the beginning of the study, review of literatures has been completed by searching ProQuest, SCOPUS and websites of various universities and Sodh-Ganga, Google search, Google Scholar etc. for selecting and searching the related literatures.

Data collection represents the key points of any research project. Data can be considered as small cells of an organism with which research questions or argument is constructed. Data which sustain the progress of a research, function as evidence to validate what is proposed or stated by the researchers, and bring about the realization of the final result. There are various techniques for collecting data that depend upon the topic and the structure of the research. Present study uses independent web search as a data collection process. Various search engines have been used for finding and selecting library websites in this study.

Moreover seventeen college libraries have been physically visited for capturing data and to under the present situations. For collecting primary data close ended questionnaires have been used in those cases. After that, Microsoft Excel has been used for comparison and analysis of the collected data.

4. Data Collections

Data has been collected by the method of purposing sampling, it is also known as judgmental, selective, or subjective sampling, is a form of non-probability sampling in which research rely on their own judgement when choosing members of the population to participate in their study.

Data has been collected from various district in W.B. such as Bankura, Bardhaman, Birbhum, Coachbihar, East Midnapore, West Midnapur, Hooghly, Howrah, Kolkata, Jalpaiguri, Malda, North 24 Pgs, South 24 Pgs, Darjeeling etc. from there various Govt and Govt aided colleges by a specific questionnaire. Sometimes it collected applying by interview method or by telephonic method or via WhatsApp.

5. Data Analysis

5.1 Type of colleges

It is needed because to know from where the data is collected, to know specific figure of selected Government colleges and Government aided colleges of W.B.

Table no.1: Statement showing category of colleges

Sl. No	Types	No. of Respondents	Percentage
1	Government	5	08.33
2	Government Aided	55	91.67
Total		60	100.00

A pie chart has been given below by using the above table.

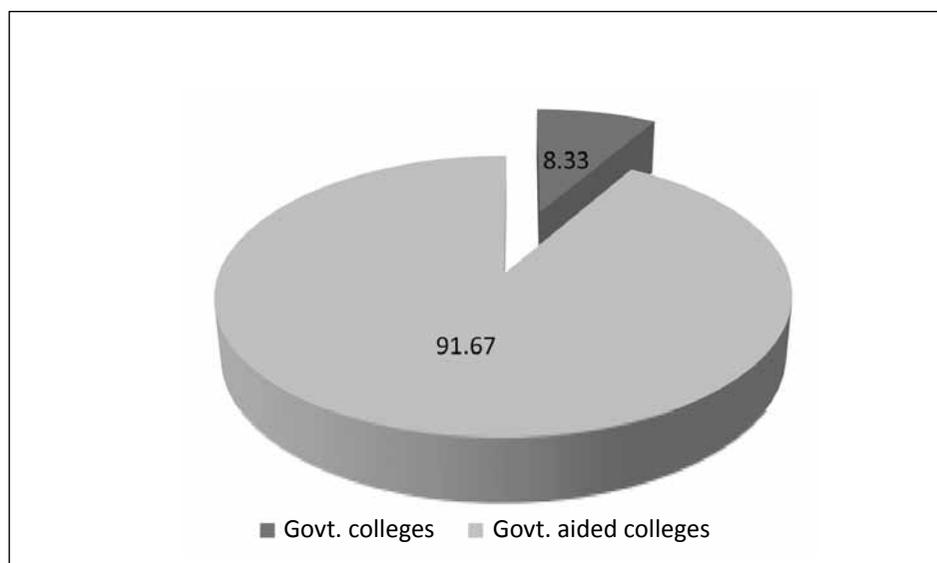


Chart no.1: Category of colleges taken in this study

Results: The study includes 8.33% of government colleges and 91.67% of government aided colleges. It shows that out of 61 colleges, maximum number of colleges are affiliated by the University of Calcutta and Burdwan University, Kalyani University, North Bengal University, West Bengal State university, Vidyasagar University and Bankura University, Kazi Nazrul University in West Bengal.

5.2 Grade of Colleges

National Assessment and Accreditation Council play a role as performance descriptor. It need because to know by performance colleges grade.

Table no.2: Statement showing NAAC Grade colleges

Sl. No.	NAAC Grade	No. of colleges	Percentage of colleges
1	A+	2	03.34
2	A	6	10.00
3	B++	11	18.34
4	B+	9	15.00
5	B	19	31.67
6	C+	1	01.66
7	C	7	11.66
8	No Grade	5	08.33
Total		60	100.00

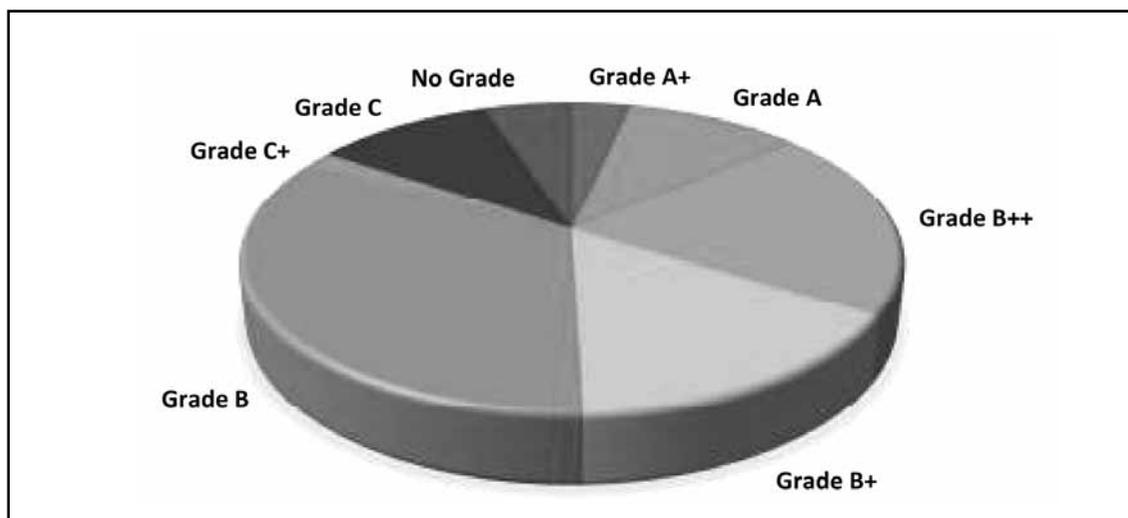


Chart no.2: Category of NAAC Grade of colleges

Results: Grade A+ = 3.34%, Grade A= 10%, Grade B++ =18.34%, Grade B+ =15%, Grade B = 31.67%, Grade C+= 1.66%, Grade C= 11.66%, No Grade = 8.33%.The Result is showing that B grade holder Colleges are maximum and the minimum number of grade holder is number C+.

5.3 Library Collections:

It is need to know library collection wise preservation frequency period.

Table- 3: Library Collection wise Frequency of preservation and conservation:

Sl. No.		Frequency					Total
		Up to 10,000	10,001- 20,000	20,001- 30,000	30001- 40000	Above 40000	
1	Once in a year	0	8	5	6	13	32
2	Twice in a year	0	6	1	0	3	10
3	More than 4 times	0	4	3	4	3	14
4	Never	1	0	2	0	1	4
Total Colleges		1	18	11	10	20	60

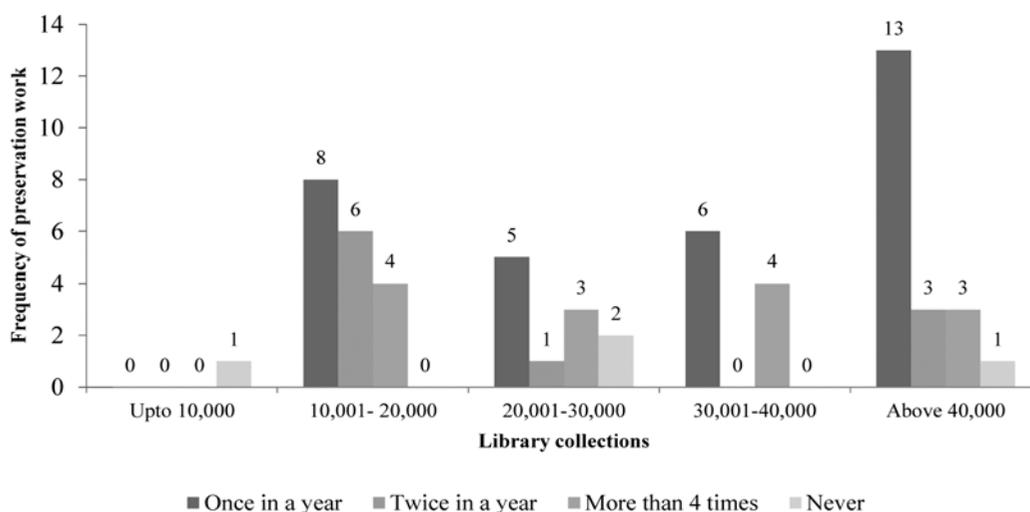


Chart no. 3: Total collections and frequency of preservation work

Results:From the above chart and table it is ture that the libraries having higher collections maintain their preservation work more frequently. Most of the colleges maintain their preservation and conservation related work once in a year. It is clear that the libraries with collections upto 10,000 do not maintain their preservation work regularly.

5.4 Frequency of preservation and conservation work

It is needed to take preservation and conservation work of books for the library for reasonable period. Many of the libraries do this work once in a year or twice or thrice in a year. The present study finds the following frequency:

Table no. 4: Statement showing frequency of preservation and conservation work:

Sl No.	Time Frame	No. College Libraries	Persentages
1	0-6 Months	16	26.67
2	1 Year	27	45.00
3	2 Years	7	11.66
4	2 Years above	4	06.66
5	When require	1	01.67
6	Never	5	08.34
Total		60	100.00

A pie chart has been given below by using the above table.

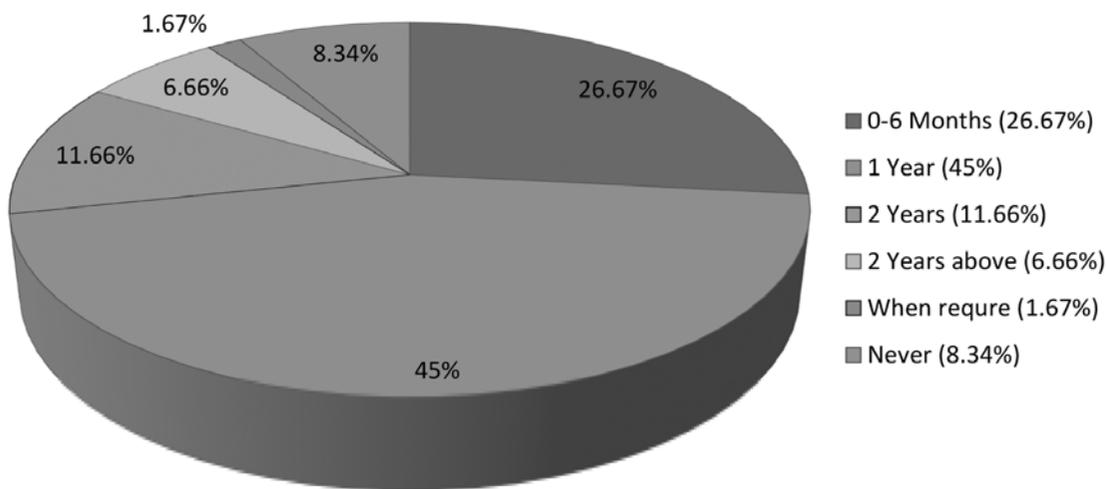


Chart no. 4: The pie chart showing frequency of preservation and conservation work

Results: Among the 60 colleges, maximum number of colleges in West Bengal use preservation techniques between once in the year (45%), 26% of colleges used preservation works between 0 to 6 months, 11% of colleges use preservation services twice in a year, 8.34% of colleges never used preservation services, 6.66% of colleges used preservation above 2 years, and 1.67% of colleges used preservation when requirement.

5.5 Preservation techniques

Various preservation and conservation techniques are used by the libraries. But in the college libraries a limited technique has been found. The present study finds the following techniques which have been applied in those libraries.

Table no. 5: Statement showing various preservation techniques

SI No.	Preservation Techniques	No.of colleges	Percentage
1	Binding	54	90.00
2	Cleaning and Dusting	59	98.33
3	Deacidification	0	0
4	Fumigation	9	15.00
5	Insect repellent	50	83.33
6	Laminataion	2	03.33
7	Photocopying	43	71.66
8	Scanning	40	66.66
9	Security System	51	85.00

A bar chart has been given below by using the above table.

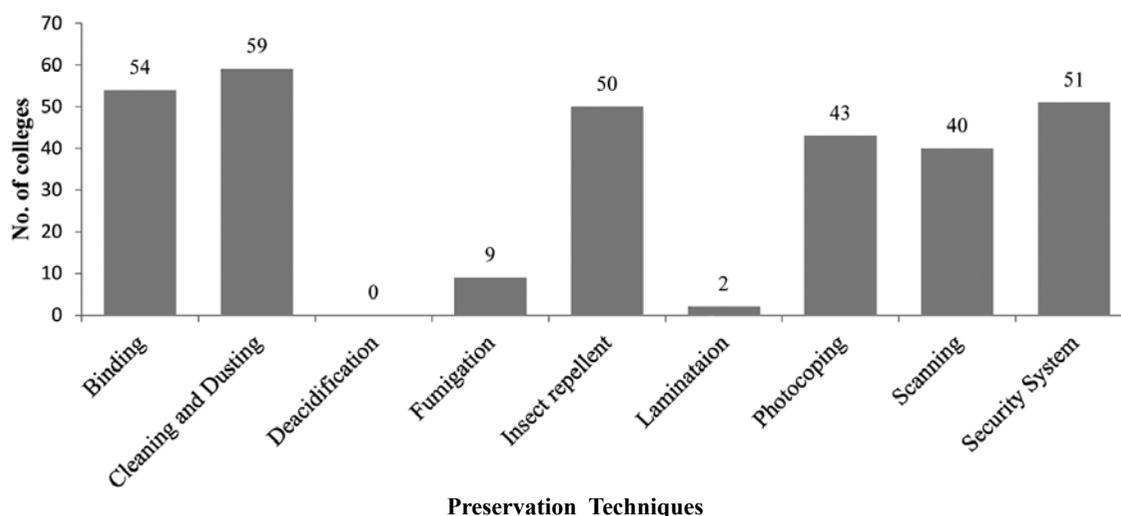


Chart no. 5: The bar chart showing different kinds of preservation techniques

Results: The above table and chart show that almost all of the college libraries (98.33%) use cleaning and dusting in a regular basis. Many of the libraries (90%) take measures by binding the old books. It is good in the picture that many of the libraries (85%) are aware about security system in their libraries. 83.33% of the college libraries apply insecticide for insect repellent. A least number of libraries (15%) use fumigation techniques. None of the libraries uses deacidification techniques in their libraries.

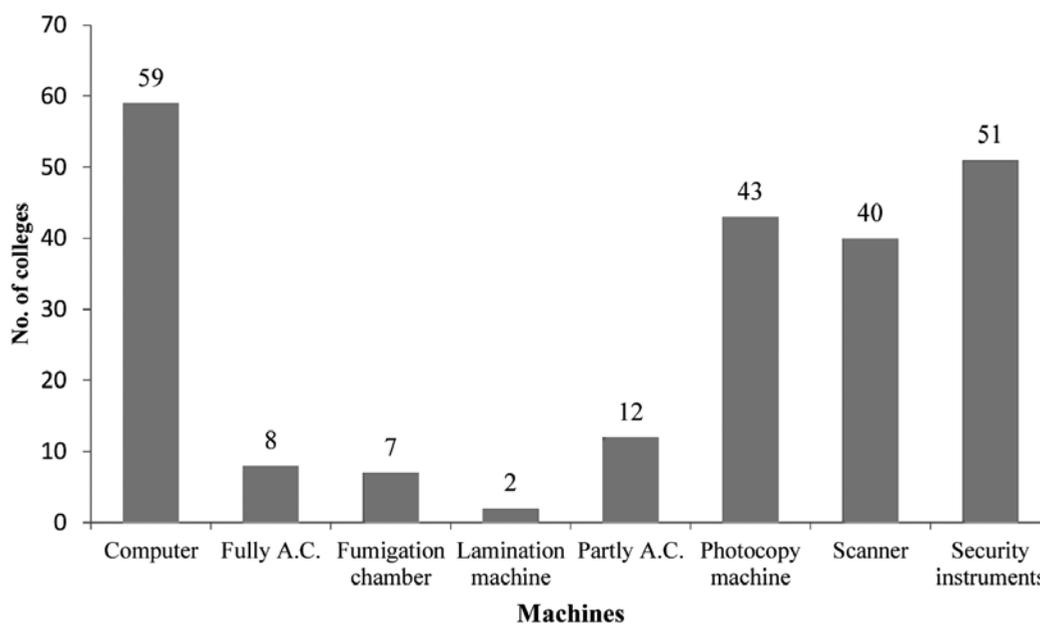
5.6 Preservation machines used in libraries

It is needed to take by which machine form the used for preservation.

Table no. 6: Statement showing different preservation techniques are used by the libraries:

Sl. No.	Name of the Machines	No. of colleges	Percentages
1	Computer	59	98.33
2	Fully A.C.	8	13.33
3	Fumigation chamber	7	11.66
4	Lamination machine	2	03.33
5	Partly A.C.	12	20.00
6	Photocopy machine	43	71.66
7	Scanner	40	66.66
8	Security instruments	51	85.00

A bar chart has been given below by using the above table.



Results: The table and chart shows that all of the college libraries (98.33%) have computer for preservation. Many of the libraries have security instruments (85%) and photocopy machines (71.66%). A good number of college libraries (66.66%) hold scanner machine for scanning old and rare documents. A least number of college libraries hold lamination machine (3.33%). It is good that a considerable number of libraries have installed ACs.

5.7 Physical form of binding materials

The present study finds at least 100 different types of binding materials. Many of the colleges have both cloth and leather binding books and others have only cloth binding books. A least number of libraries have palm leaf binding materials.

Table no. 7: Statement showing different physical form of binding materials

Sl. No.	Binding materials	No. of colleges	Percentages
1	Cloths	18	30
2	Leather	21	35
3	Paper	60	100
4	Palm Leaf	3	5

A bar chart has been given below by using the above table.

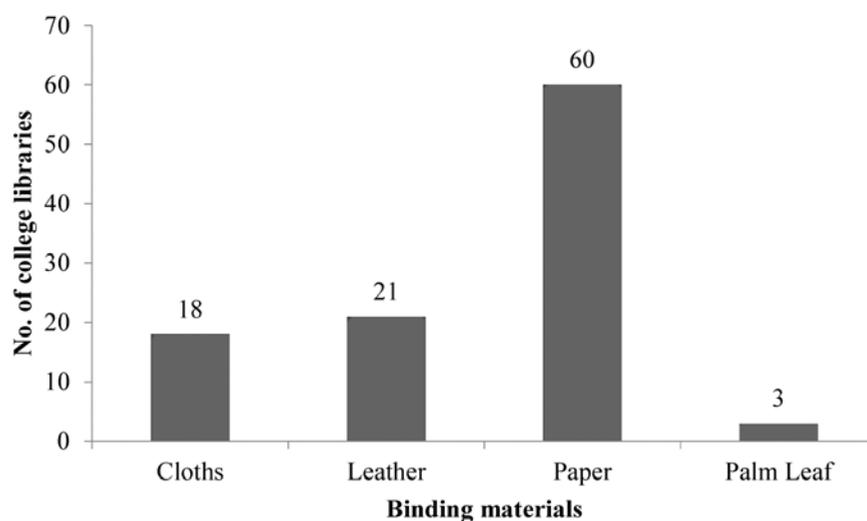


Chart no. 7: Different physical form of binding materials

Results: Above table and the bar chat state that 18 libraries (30%) have documents in cloth binding and 21 libraries (35%) have leather binding documents. All of the 60 libraries have books in paper binding. A least number of libraries i.e 3 (5%) have palm leaf books with palm leaf cover binding.

5.8 Initiative for Digital Library

Recently many of the libraries have taken initiative for digital library system. The present study shows the status about it.

Table no.8: Statements showing digital library system

Sl. No.	Digital Library	No. of Colleges	Percentages
1	Fully Digital	11	18.34
2	Partly Digital	16	26.66
3	Not Using	33	55.00
Total		60	100.00

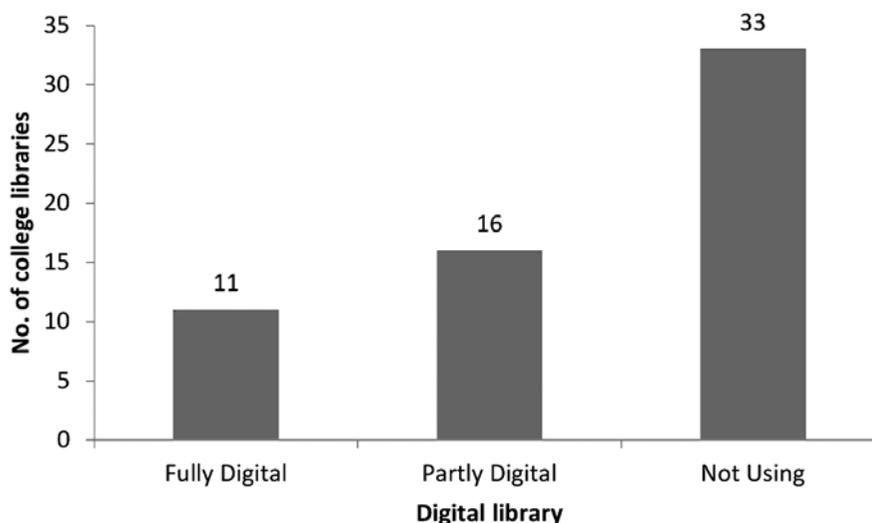


Chart no.8: Status of digital library initiation in college libraries

Results: From the above table and chart it depicts that only 11 libraries (18.34%) has successfully initiated digital libraries and 16 libraries (26.66%) libraries have partially implemented digital library initiative in their system. Rest of the libraries i.e. 33 (55%) libraries do not take any initiative regarding digital library system.

5.9 Barrier of preservation and conservation work

There are many barriers in preservation and conservation work in the college libraries in West Bengal. The present study finds many of the barriers about it. The following table shows a synoptic view of this.

Table no. 9: Statement showing the barrier of preservation and conservation works

Sl. No.	Types of Barriers	No. of Colleges	Percentage
1	Inadequate Funding	36	60
2	Infrastructure	15	25
3	Lack of Man Power	45	75
4	Others	15	25

A bar chart has been given below by using the above table.

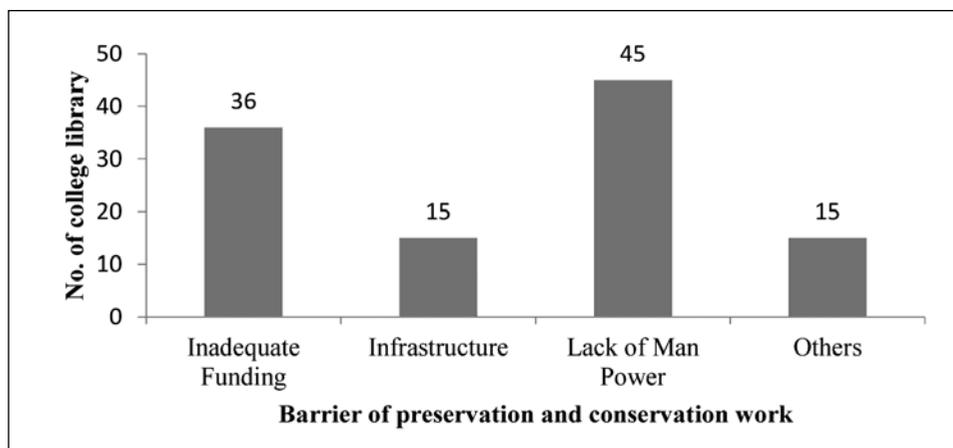


Chart no.11: Barrier of preservation and conservation work

Results: The table and chart show that 36 colleges (60%) suffer from the problems of inadequate funding and 15 colleges (25%) face the problems of infrastructure to fulfill the works relating to preservation and conservation. Most of the college i.e. 45 (75%) directly state about lack of manpower in their libraries and rest of the colleges (25%) show multiple problems like administrative and others.

6 Conclusion and Recommendations

6.1 Conclusions

Library materials are the heart of libraries. They are vital to learning and provide information, and in the future sustain knowledge and allow interpretation of the past. Every college library, large or small should have a well-defined programme for preserving the materials which it houses. In planning for preventive preservation, users and staff should be aware of their roles in the preservation programme. S.R. Ranganathan in one of his five law of library science postulates that, “books are for use”. If the materials are not well kept, they cannot provide that function because the most effective way to establish longevity of books or materials is to prevent or retard deterioration. College libraries in W.B. should not only strive to acquire materials but should ensure that the materials acquired are preserved and conserved in a usable condition for generations of students. Libraries should be air-conditioned as its importance to library materials cannot be over-emphasized. Though damage to library materials are sometimes unavoidable, but with careful preventive measures, deterioration of the materials may be lessened or prevented as the old adage says “prevention is better than cure”.

6.2 Recommendations

The study observed a large number of disadvantages regarding preservation and conservations in college libraries. A set of recommendations have been suggested for the betterment of college libraries regarding preservation and conservations of library collections.

1. There should be regular trainings through workshops and seminars on the librarians to enable them inculcate or educate the students about preservations.
2. Preservation and conservation of these library materials are vital therefore, there should be mastery of the ways to protect, handle and organize these materials.

3. For the library to develop properly they need not only human but also materials such as infrastructure which help the library to carry out its preservation works.
4. Adequate funding the effective functioning of the library, adequate fund is needed specially to get the best in this regard out from the other factors.
5. Lack of man power is the valuable problem of college libraries in Howrah. So every college Libraries need to provision man power.
6. Need structural changes be according to green library guidelines, if any.
7. Lack of preservation and conservation instruments in college libraries in W.B. Its direct effect to library materials. So these instruments must be procured immediately.
8. Provision of internet infrastructure with large band width to ensure adequate network connectivity for sharing digital rare documents.

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Open Source Software and Library Services

Susmita Ray

Librarian, Indian Institute of Social Welfare & Business Management

Email: susmitaray2000@yahoo.com

***Abstract:** Open Source Software is a software that a user can access, modify, change and distribute among others. This does not involve much cost like the proprietary software. It can be used for Library automation, Digital Library management, Knowledge management and Web publishing. Open source software requires some knowledge of programming. Library Professionals are reluctant to use the Open Source Software in the Library but they should think about the advantages of open source software and try to use it in the Library. In this paper an overview of different Open Source Library Software is highlighted. Library professionals can effectively use these software to provide innovative services to the users.*

***Keywords:** Open Source Software; Library Technology; Library Services*

1. Introduction

Open source software is software which has a source code that anyone can inspect, modify, change and improve. Source code is the part of software that most computer users doesn't even see. It's the code that computer programmers can manipulate to change how a piece of software/programme/application works. Source code of this software is available to everyone so that they can use it to improve or modify according to their need. It is usually developed in a public collaborative manner.

1.1 What is the difference between open source software and proprietary software?

The source code of some software is only available to the developer, the team or organization who created it. They have exclusive control of it. They can only modify the source code according to need. The user of that software has no control of that source code. This type of software is known as "Proprietary software" or "Closed source software"

Only the original authors of that software can legally copy, modify and change the source code. The users of the software must agree that they will not do anything which is not permitted by the authority. Usually they sign the license agreement before purchasing the software. Microsoft Office, Adobe Photoshop are examples of proprietary Software.

But the concept of Open Source Software is different. The authors make the source code available to others who would like to view the code. They can copy, learn, modify and improve the source code. The users of open source software must accept the terms and conditions of a license when they used the open source software buy it is totally different from that of proprietary software. **LibreOffice** and **Koha** are the example of open source software.

1.2 Does open source software means that it is totally free of cost?

Open Source Software does not means that it is totally free (economically free). The programmers of Open source software can charge money for the open source software they create. But in some cases an open source license might require to release their source code when they sell it to others. The programmers can take money for the software services and support as they think that they are giving the source code free of cost and charging the money from the user for installation, use and troubleshooting. The users also have to pay less amount in comparison to the proprietary software.

2. Why Open Source Software is more preferable than the proprietary software

People prefer open source software than the proprietary software for a number of reasons:

Control: People prefer open source software because they have more control over the source code. They can examine, change, modify and improve the code as per their need.

Training: As the source code is publicly assessable the student can study the code and can modify it to make it better software. They can share the code among group and also invite comments and criticism and rectify the mistakes. In this way they can develop their skill.

Reliable and Security: Some people think that it is more secure than the proprietary software because anyone can have access the source code can identify any mistake that may be overlooked by the original author of the code. They can also rectify the mistake. Another reason is that many programmers can access the source code at the same time so that they can work together on that source code and modify the source code according to their need. So the bugs can be fixed more quickly than the proprietary software.

Stability: Many people think the Open source software has more stability than proprietary software. If any proprietary software company

stopssupports of that particular software then the users don't have any option but to stop using that particular software. But in open source software as the source code is available publicly they can use and modify according to their need.

Simple and easy to use: The interface of open source library management software is extremely easy to use. The user interface of most Library Management system is simple and user friendly. Hence there is no requirement of hiring any additional IT help for using the software.

3. Is open source software only important to programmers only?

No, open source software is not important to programmers only. The non-programmers as well are using many software that are open sourced. Early inventors built much of the internet using open source software, eg LINUX operating system and the Apache Web Server Application – anyone using the internet today benefits from open source software.

We, the non programmers are using e-mail for our daily communication, search different information through internet – all are based on open source software. We also play music online, view different videos, chats with the friends – all are through open source software. Our mobile phones, gaming console, computers connect to a global network using open source software to transmit data to the local devices in front of us. Some people call remote computing as cloud computing as it involves activities that incorporate not only local devices but also a global network of remote computers that forms an atmosphere around them. Cloud computing is an increasingly important aspect of everyday life with internet connected devices.

4. Open Source Software for Libraries:

4.1. Library Automation:

4.1.1. Koha: Integrated Library System Koha is open source Integrated Library Software. Currently Koha is being used by librarians all over the world. It is a web based software so

there is no need to manage a separate server to run Koha. From backups to upgrades and system maintenance, everything is managed online. It has self-checkout interfaces making it a complete web based solution. Koha is built using ILS standard and uses OPAC.

4.1.2. NewGenLib (New Generation Library)

NewGenLib is an open source integrated library management software which can be used in mobile as well as tablets. You can even interact with the users by sending messages using their twitter integration. RSS feeds and own search fields are included in OPAC. It supports RFID technology.

4.1.3. Evergreen Evergreen library software is open source Library software. It is capable of supporting the workload of large libraries. It helps library professionals to manage Catalogues, Circulation and inventory effortlessly. Library members get an option of self – checkout.

4.1.4. Opals OPALS is an automated open source library management system that can be used for various kinds of libraries. Unlimited number of library members can access OPALS online, at the same time. This open source software has acquisition management, circulation management and advanced indexing feature. Since this free library management is cloud-based, you can get real-time reports.

4.1.5. OpenBiblio This is one of most used open source library management system. This is majorly used in small-scale libraries. This software provides circulation management, cataloguing management, OPAC. It retrieve all the required information from your database in the form of reports such as overdue letters and other statistical factors regarding library materials.

4.1.6. Invenio Invenio is an open source library software. It is an all-in-one platform for research data management, institutional repository management and asset management. This software has circulation, cataloging, and acquisitions. One

can also find a toolbox to create applications like enterprise search, digital repositories, discovery mechanisms and data management systems.

4.1.7. Librarian Librarian is the best software to be used in schools, colleges, medical and even legal libraries. Its user-friendly search interface helps in a smooth acquisition process. It generate ID cards with barcode and photograph, It also has email management.

4.2. Digital Library:

4.2.1. Greenstone Digital Library Software

Greenstone is a suite of software for building and distributing digital library collections. It provides a way of organizing information and publishing it on the web or on removable media (DVD, USB). The aim of the Greenstone software is to empower users to build their own digital libraries.

4.2.2. DSpace DSpace is an open source repository software package. It is used for Institutional repository that capture, stores, indexes, preserves and redistributes the intellectual output of an Institute. It is used for creating open access repositories for scholarly and/or published digital content. DSpace repository software serves a specific need as a digital archives system, focused on the long-term storage, access and preservation of digital content.

4.2.3. EPrints is a free and open-source software package for building open access repositories that are compliant with the Open Archives Initiative Protocol for Metadata Harvesting. It shares many of the features commonly seen in document management systems, but is primarily used for institutional repositories and scientific journals.

4.2.4. CDS-Invenio CDS-Invenio is a open source digital Library Software. It is flexible and powerful and suitable to handle very large full text collection of Library. It uses MARC-21 bibliographic standard.

4.2.5. Fedora Fedora software is focusing on innovation, integrating new technologies and it works closely with upstream Linux communities. This software gives organizations a flexible service-oriented architecture for managing and delivering their digital content.

4.3. Web Publishing:

4.3.1. Wordpress WordPress is a content management system (CMS). Building a web site from scratch can be done by WordPress. It has visual rich editor that help publishing text and photos to the web site. It has built in RSS (Real Simple Syndication) technology to keep subscribers updated and a comment system that allows readers to interact with the sites content.

4.3.2. Drupal Drupal provides a back-end framework for at least 2.3% of all websites worldwide ranging from personal blogs to corporate web sites, Internet applications, personal websites, E-commerce applications, political, and government sites. Drupal is used for knowledge management and business collaboration.

4.4. Other Computer Programs:

4.4.1. Ubuntu Ubuntu is a open-source Linux distribution. Ubuntu is a popular operating system for cloud computing. A default installation of Ubuntu contains a wide range of software that

4.4.2. Open Office Apache OpenOffice (AOO) is an open-source office productivity software suite. It is a close cousin of LibreOffice and NeoOffice. It contains a word processor (Writer), a spreadsheet (Calc), a presentation application (Impress), a drawing application (Draw), a formula editor (Math), and a database management application (Base). [6] Apache OpenOffice is developed for Linux, macOS and Windows.

4.4.3. Firefox

Mozilla Firefox, or simply Firefox, is a web browser. It is an answer to Microsoft's Internet

Explorer Web Browser. Firefox offers a much more secure browsing experience in compare to IE.

4.4.4. Thunderbird Thunderbird is the Mozilla foundations opensource alternative to Microsoft's Outlook. This program works exactly like Outlook, providing a secure and safe desktop email solution.

4.4.5. PDF Creator The PDF (Portable Document Format) is an industry standard that everyone uses everyday. The purpose of creating a PDF file is usually to provide an important document for display that cannot be modified by the reader (Unless permission is given). By using open source PDF creator one can take open office files and convert them into professional PDF format. We can reduce the size of the document by converting it into a PDF file.

5. Selection criteria for open source software:

For selecting the open source software we can consult our professional friend who have experience in using the open source software for their library. Some open source software is highly popular in the librarian community. For example, KOHA is highly popular among other open source software. Koha has a user community which can help us if we face any problem using KOHA.

Websites which provide detailed listing of open source software are:

- Free Software Foundations software directory (www.fsf.org)
- UNESCO Free & Open Source Software Portal (www.unesco.org)
- SourceForge (<http://sourceforge.net/>)

Open source license assure users freedom to use, copy, modify and distribute the software. General public License (GPL) is the most popular license for free and open source software and provide feasible terms of use. Using GPL license one can use, modify and distribute the software without the permission of the creator.

The development and maintenance of open source software is a social collaborative activity. Open source software is developed round the clock by a large number of programmers from all over the world. Some people claim that open source software is more innovative than closed software as different people from different organisations look at the software from different perspective. Most of the open source software is available with web interface and it is easy to learn and use. Templates of open source software are possible to customise and users can add new design. Through redesigning the templates open source software can easily integrate library / Institutional website.

Users are mainly responsible for the deployment of open source software. Detailed and up-to-date documentation is a prerequisite for successful installation and maintenance of open source software. Open source software documentation is available through project websites, wikis, blogs and email lists. They give information of software installation in various operating systems, software architecture, database structure, history of bug fixes, changes in new release. Installation details and information for users are also available with installation package.

6. Conclusion:

From this we can conclude that using of open source software is important in the library. By using open source software the extra amount which we have to spend on proprietary software can be used to buy more books, journals and other e-resources for the library. We can use this amount to provide technical support to the user to use the

resources that are already available in the library in a better manner. But still now there are some problems with this open source library software. It has lack of formal support than proprietary software and changing the source code require a lot of technical knowledge. In near future we hope that these problems will be rectified and we can use the open Source Software more widely as library automation and the use of open source software are relevant for achieving optimal library effectiveness at a minimal cost.

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