DIGITAL LIBRARY EDUCATION IN INDIA: PRESENT STATUS WITH A VIEW TO FRAME A FUTURE MODEL CURRICULUM

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The present day information systems (digital libraries) play a catalytic role in realizing a knowledge society and consequently these have been debated ranging from their development to the recent trends. However, growth and use of the digital libraries lies in the orientation for digital library education in the institutions offering the Library and Information Science courses.

Further, in response to proliferation of digital information accessible over networks, significant changes have taken place in Library and Information Science (LIS) education (Ankem, 2004) like different services associated with libraries are shifting from analog to digital mode. So, Library and Information Science education need to include digital library (DL) education in its ambit. (Deegan & Tanner, 2002). Allard (2002) also stresses upon the importance of DL education in LIS curriculum to evolve up with a strategic future plan for digital libraries. Such change in the curricula of LIS schools especially by inclusion of DL modules is very important for the future of Library and Information Science profession (Pettigrew & Durrance, 2001; Baruchson-Arbib & Bronstein, 2002). Thus teaching and advocacy of digital librarianship in the educational institutions offering LIS courses may prove more fruitful and hence an attempt has been made to survey present status of Indian schools in imparting digital library education and draw a blue print for future education. The endeavour seems more relevant as a few studies are already available from India by Varalakashmi (2009) and Mahapatra (2006)

Literature Review
Studies carried by different authorities (Spink and Cool, 1999; Saracevic & Dalbello, 2001 a, b; Liu, 2004; Weech 2005; Ma, Clegg
& O’Brien, 2006; Miwa, 2006; Tammaro, 2007; Koltay and Boda, 2008; Bakar, 2009; Yang, Fox, Wildemuth, Pomerantz and Oh, 2009; Varalakshmi, 2010; Yang, Kanan and Fox, 2010; Al-Daihani, 2011) reveal that LIS schools are offering DL education mainly in West but the real leader in the digital library education is Computer Sciences in 1980’s and Library Science has been a follower in 1990’s (Weech, 2005; Tammaro, 2007). A survey at the close of 20th century reveals that very less number of schools offered courses specifically in digital libraries at a global level (Spink and Cool, 1999). It concludes that an urgent need for the development of DL education programs took place amidst a burgeoning growth of DL research and practice by librarians, and information and computer scientists. It is astonishing to see countries outside U.S have also made contributions in the DL curriculum but with no sound conceptual background with India having no score at all. Besides, Saracevic and Dalbello (2001a, b) also present results from a survey on digital library education in academic institutions. Weech (2005) portrays a global survey of LIS digital librarianship education and has found that the technical level of content of digital librarianship in North America is less than in Europe. The study reveals that Computer Science schools also offer limited number of courses in the digital librarianship. Coleman (2002) feels that the fusion of Librarianship and Computer Science domains work better for a model DL education curriculum. Rasmussen (2006) also argues that digital librarians will be required to have more breadth and depth of knowledge and skills across the dimensions of traditional library knowledge, technology, and human relations. Because of the complexity of digital libraries and digital library projects, professional education programs for digital librarians should provide not only technical skills and traditional library training but also should place greater emphasis on management, including project management skills through practical experience of a digital project. Yang, Fox, Wildemuth, Pomerantz and Oh (2006) stress upon the interdisciplinary curriculum development for DL education. The curriculum development for DL education must be interdisciplinary is argued by Kajberg & Lorring, 2005 (as cited in Yang, Fox, Wildemuth, Pomerantz & Oh, 2009) and Spink and Cool (1999). Liu (2004) reflects the North American, European and Asian canvas of DL education and reveals a balance of theory and technology.
Bawden, Vilar, & Zabukovec (2005) analyze the DLE programmes of formal and continuing education in Slovenia and in the United Kingdom.

However, Ma, Clegg and O’Brien (2006) examined that number of institutions offering programmes or courses in digital library education is still increasing. The facts show that 43% of such programmes or courses are stand-alone rather than integrated with wider material which clearly indicates the importance of DL education in the LIS curriculum. Miwa (2006) also highlights some of the trends and issues in LIS education in select Asian countries (China, Korea, Singapore, Taiwan, and Thailand) which relates that the digital library education in LIS curricula is evolving in tune with the I-Schools in U.S and IFLA guidelines in developing new curricula that focus on ICT skills, including record management, digital archiving, information/knowledge management, digital libraries, information security, entrepreneurship, digital/computer information processing, copyright, media, publishing, and communication. Mahapatra (2006) also expresses a dire need for the revision of LIS curriculum in the present digital era. The author also evolves up with some proposed suggestions in the LIS curriculum in the field of digital librarianship. Yang et al (2007) describe the curriculum framework for DL education stressing on Superimposed Information (SI) and Visual User model Data Mining (VUDM) technologies. Tammaro (2007) has surveyed digital library education trends in Europe and concludes that LIS Schools are far from ICT. He feels that present day librarians require advanced skills in IT in particular for the profile of the digital librarian. He comments that education for digital libraries seems almost entirely based on skills learned during apprenticeship and short continuing education courses which clearly reveal that DL is an important component in the LIS curriculum. Koltay and Boda (2008) makes comprehensive picture of library education in Hungary and relates it with international experiences. Yang, Fox, Wildemuth, Pomerantz and Oh (2009) reflect some of the efforts of developing a digital library (DL) curriculum by an interdisciplinary team from Virginia Tech and the University of North Carolina at Chapel Hill. They present the foundations of the curriculum building, the DL curriculum framework, the DL educational module template, a list of draft modules that are currently developed and evaluated by multiple
experts in the area, and more details about the resources used in the draft modules and DL-related workshop topics mapped to the DL curriculum framework. Bakar (2009) identifies eight Asian countries that offer independent digital library courses through their academic institutions, namely India, Indonesia, China, South Korea, Malaysia, Hong Kong, Taiwan and Thailand. Indian institutions include University of Mysore, Mangalore University & Maharaj Nagpur University. Besides, academic institutions from four other countries that offer integrated digital library courses are Malaysia, Singapore, Taiwan and Japan. Al-Daihani (2011) also explores the DL education in Information Science programmes in two LIS departments in Kuwait whereas Varalakshmi (2009) has conducted analytical study of Library and Information Science departments in Indian universities and national institutions in order to visualize their digital library course content as a part of their curricula and found that the existing digital library course content of LIS departments in India is not satisfactory. She suggests a need to revise and devise a new syllabus that reflects all aspects of digital libraries if the intention is to develop manpower to handle digital environment with proven professional capabilities. Yang, Kanan and Fox (2010) discuss about the Digital Library Curriculum Development Project (http://curric.dlib.vt.edu) team that has been developing educational modules and conducting field-tests internationally since January 2006. Many more studies have taken place but is beyond the scope of this paper for the seminar.

Problem

A well knitted curricula being the foundation for a successful educational programme for an emerging and evolutionary area of digital librarianship after understanding the existing status of digital library education in LIS curricula at different levels. No serious and planned attempt has been made in India so far except enriching present curricula with some stray elements without any objective or schedule. Hence present study is an exploratory investigation to lay a foundation for more debate, discussion and comprehension on the area.
Objective

The main objective is to explore the current state of DL education in Indian LIS schools with a view to evolve a layout for designing a future model curriculum for the Digital librarianship.

Scope

The study is limited to the University Grants Commission accredited schools for programmes offered through regular or distance mode. The courses offered by colleges and Institutes of national importance (eg NISCAIR, New Delhi & DRTC, Bangalore) are excluded from the study. Besides, the layout is based purely on literature and flair and requires further objective study to develop a useful and fruitful curriculum.

Methodology

The study takes into consideration Indian universities (Central, State and deemed universities) registered and recognized by the University Grants Commission (UGC). As on October 2011, UGC recognized 43 central universities and 281 states universities (both funded and non-funded), besides 130 deemed universities declared by UGC as on June 23, 2008. Each university’s website was checked to ascertain courses offered in Library and Information Science. Further, the syllabus of LIS courses from the respective websites of universities offering the courses was retrieved and downloaded to determine the level of digital librarianship being taught after phrases like as “digital library” and “digital libraries” etc were searched in their course contents. Of the total 454 universities, only 442 universities offer meaningful data through their respective websites. However, websites of 5 universities remained inaccessible during the study while websites of 4 universities could not provide sufficient information and the three universities do not maintain websites. The data stands further analysed under few parameters to reveal facts for analysis and interpretation.

Analysis

LIS Courses: An Overview

105 Indian universities offer LIS courses with 51 having one year Bachelors and one year Masters Programme. Two-year integrated LIS degree is being offered by 42 universities besides 12
universities offering Bachelors degree (one year) only. One university conduct three years under-graduate course in LIS (Swami Ramanand Teerth Marathwada University, Maharashtra) while one central university provides 5 years integrated UG/PG programme (with exit option on 3 years completion) in LIS (Guru Ghasidas Vishwavidyalaya, Chattisgarh) and one university has developed two years degree programme in Digital Libraries (Jadavpur University, Calcutta) (Table 1).

Table 1 LIS Degrees offered by Indian universities

<table>
<thead>
<tr>
<th>S. No</th>
<th>LIS Courses</th>
<th>No. of Universities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>State (281)</td>
</tr>
<tr>
<td>1</td>
<td>Masters in Digital libraries</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Masters in LIS (2 years)</td>
<td>32</td>
</tr>
<tr>
<td>3</td>
<td>Bachelors (1 year) + Masters (1 year)</td>
<td>47</td>
</tr>
<tr>
<td>4</td>
<td>Only Bachelors (1 year)</td>
<td>11</td>
</tr>
<tr>
<td>5</td>
<td>Integrated Under graduate/Post Graduate (5 years)</td>
<td>0</td>
</tr>
<tr>
<td>6</td>
<td>Undergraduate Degree (3 years)</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>PGDLAN</td>
<td>3</td>
</tr>
<tr>
<td>8</td>
<td>Certificate course</td>
<td>6</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>89</td>
</tr>
</tbody>
</table>

Digital Course Contents

Among 105 universities offering LIS programmes, syllabi of only 45 universities (5 central & 40 State) is available on their respective websites wherein only 35 universities (4 central and 31 state) have enhanced their curriculum with elements of digital libraries in various degrees, besides one university offering two years Masters Degree in Digital libraries.

From 130 deemed universities, only two universities offer courses in Library and Information Science, of which one provide Bachelors through correspondence (Jain Vishva Bharati Institute, Rajasthan) and the other Masters in egular mode (Gujarat Vidyapith, Gujarat). However, both universities haven’t uploaded their syllabi on their respective websites (Table 2).
Table 2 Digital Contents in Indian Universities

<table>
<thead>
<tr>
<th>S. No.</th>
<th>LIS Programme</th>
<th>No. of Universities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>State</td>
</tr>
<tr>
<td>1</td>
<td>Full Course</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Full Paper</td>
<td>9</td>
</tr>
<tr>
<td>3</td>
<td>Unit(s)</td>
<td>14</td>
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<tr>
<td>4</td>
<td>Partial Unit(s)</td>
<td>7</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>31</td>
</tr>
</tbody>
</table>

Digital Contents: State-Wise Distribution

Out of 454 universities located in 31 different states/union territories, 105 universities in 25 states/union territories teach different courses in LIS. However, only 35 universities (in 15 states/union territories) have introduced digital libraries in their course content which reveal that Karnataka and Maharashtra has the highest share in taking the lead. About fifteen states have not yet made their contents rich with elements of Digital Librarnship. It is serious concern for educationists, policy makers and all other stakeholders to upgrade their course contents for safe and timely shift to for better service to users and patrons. (Table 3).
### Table 3: Digital contents in Indian schools: State/U. T Distribution

<table>
<thead>
<tr>
<th>State/Union Territory</th>
<th>No. of Universities</th>
<th>State</th>
<th>Central</th>
<th>Deemed</th>
<th>Total</th>
<th>Uni. offering LIS course(s)</th>
<th>Uni. with Digital content in LIS course(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Andhra Pradesh</td>
<td>30</td>
<td>3</td>
<td>7</td>
<td>40</td>
<td>8</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Arunachal Pradesh</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Assam</td>
<td>4</td>
<td>2</td>
<td>0</td>
<td>6</td>
<td>3</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Bihar</td>
<td>14</td>
<td>1</td>
<td>2</td>
<td>17</td>
<td>4</td>
<td>0</td>
<td></td>
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<tr>
<td>Chandigarh</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Chhattisgarh</td>
<td>10</td>
<td>1</td>
<td>0</td>
<td>11</td>
<td>3</td>
<td>0</td>
<td></td>
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<tr>
<td>Delhi</td>
<td>5</td>
<td>5</td>
<td>12</td>
<td>22</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Goa</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
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<tr>
<td>Gujarat</td>
<td>18</td>
<td>1</td>
<td>2</td>
<td>21</td>
<td>8</td>
<td>2</td>
<td></td>
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<tr>
<td>Himachal Pradesh</td>
<td>5</td>
<td>1</td>
<td>0</td>
<td>6</td>
<td>1</td>
<td>0</td>
<td></td>
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<tr>
<td>Haryana</td>
<td>9</td>
<td>1</td>
<td>5</td>
<td>15</td>
<td>2</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Jammu &amp; Kashmir</td>
<td>6</td>
<td>2</td>
<td>0</td>
<td>8</td>
<td>2</td>
<td>2</td>
<td></td>
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<tr>
<td>Jharkhand</td>
<td>7</td>
<td>1</td>
<td>2</td>
<td>10</td>
<td>1</td>
<td>0</td>
<td></td>
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<tr>
<td>Karnataka</td>
<td>20</td>
<td>1</td>
<td>15</td>
<td>36</td>
<td>9</td>
<td>5</td>
<td></td>
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<tr>
<td>Kerala</td>
<td>11</td>
<td>1</td>
<td>2</td>
<td>14</td>
<td>4</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Madhya Pradesh</td>
<td>15</td>
<td>2</td>
<td>3</td>
<td>20</td>
<td>9</td>
<td>1</td>
<td></td>
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<tr>
<td>Maharashtra</td>
<td>19</td>
<td>1</td>
<td>21</td>
<td>41</td>
<td>10</td>
<td>6</td>
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<tr>
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<td>Nagaland</td>
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<td>Punjab</td>
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<td>2</td>
<td>10</td>
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<td>Rajasthan</td>
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<td>8</td>
<td>23</td>
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<tr>
<td>Tamil Nadu</td>
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<td>55</td>
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<td>1</td>
<td>0</td>
<td>0</td>
<td></td>
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<tr>
<td>Uttar Pradesh</td>
<td>23</td>
<td>4</td>
<td>10</td>
<td>37</td>
<td>12</td>
<td>4</td>
<td></td>
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<td>Uttarakhand</td>
<td>6</td>
<td>1</td>
<td>4</td>
<td>11</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>West Bengal</td>
<td>20</td>
<td>1</td>
<td>1</td>
<td>22</td>
<td>8</td>
<td>2*</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>281</td>
<td>43</td>
<td>130</td>
<td>454</td>
<td>105</td>
<td>35</td>
<td></td>
</tr>
</tbody>
</table>

*One university (Jadavpur University, Calcutta) offer full time 2 years Masters Course in Digital Librarianship*
Future Model Curriculum: An Outline

Based on the survey and status of digital librarianship in India and parallel development in Asian and Western countries, an attempt is made to evolve a future model curriculum for further deliberations, comments and suggestions. The contents, we believe, will form the future vision of librarianship in India.

Objective for the Curriculum Modules

To understand working, operation and issues related to digital librarianship for developing Human resource for developing, enriching, preserving and accessing and disseminating social, cultural, technical and educational information. The main issues are:

i) Architecture, systems, tools and technologies;
ii) Digital content and collections;
iii) Metadata;
iv) Interoperability;
v) Standards;
vi) Knowledge organization systems;
vii) User and usability and;
vii) Legal, organizational, Economic and Social issues.

Based on above issues, following modules and with preliminary annotation are given for discussion and deliberation.

Module I: Architecture, Systems, Tools and Technologies

Sub themes:

• Architecture: concept and components
• Open Networked architectures for new information environments;
• Novel search and retrieval techniques (like federated search using data fusion, mediator architecture and integrating links and ranking)
• Audio-visual and multimedia information retrieval systems;
• Content management systems;
• Intelligent systems for indexing, abstracting and information filtering;
• Harvesting and interoperability technologies; and
• Collaborative, visual, 2D and 3D interfaces.

Module II: Digital Content and Collections

Sub themes:

• Collection development strategies, policies & management.
• Technical barriers in collections of information.
• Formulating strategies for sustainable & scalable collections
• Encouraging the development of new collections
• Creation of digital objects & electronic publishing
• Creation of new genres of digital objects
• Digital preservation & web archiving

Module III: Metadata
Sub themes:
• Metadata: Concept, development, Functions etc
• Humans and algorithmic approaches to metadata provisions
• Choice and selection of metadata formats
• Metadata standards and their Application across digital collections
• Metadata harvesting
• Developing metadata extensions for pedagogical purposes
• Cross Walks: Mapping between different metadata formats.

Module IV: Interoperability
Sub themes:
• Interoperability: concept and operation across DL
• Evaluation of interoperability features
• Open Archives Initiative (OAI): Concept, application and limitation
• Z 39.50: Concept, application and limitation

Module V: Standards
Sub themes
• Digital collection development standards
• Archiving and preservation standards
• Metadata formats (Dublin Core, MARC, IMS)
• Cataloguing content & indexing standards

Module VI: Knowledge organization Systems
Sub themes:
• Thesauri and classification systems: Cross-browsing and cross-searching across collections
• Creation of ontologies using different techniques and existing thesauri;
• Classification systems and specialised controlled vocabularies: knowledge representation facility for digital collections.
• Taxonomies: development and use for different digital repositories across different layers.

Module VII: User and Usability

Sub Modules:
• Empirical studies of users interacting with digital libraries
• Usability, accessibility and user acceptance of digital libraries
• User-centred support for learning, teaching and research through the convergence of virtual learning environmental and digital libraries;
• Human-computer interaction; and
• Evaluation of the behaviour of diverse user communities based on their knowledge base, age level, and particular needs

Module VIII: Legal, Organisational, Economic & Social issues

Sub themes:
• Intellectual property; IP and global market;
• Legal issues: access, licensing, copying and dissemination of digital materials, economics, business and pricing models and strategies; and
• Sustainability and survivability: business models and marketing strategies.
• Alternative laws: GNU; Creative commons etc;
• Open Access ; Open Source softwares : Concept , Status and limitations.

Module IX: Project Report

(The report may be submitted on any area of specialization at the end of the term chosen after a careful investigation, research and advanced theme in the area.)

Module X: Field Report

(The students may be exposed to different initiatives during the programme and accordingly can submit report after careful study of their working, status etc.)
The models are subject to further development, enhancement from time to time and orientation according to needs of the region, school and student capacity and infrastructure at different levels and stages.

**Conclusion**

Thus an urgent need arises to reframe the LIS curriculum to harmonize it with digital library scenario. Embedding of DL Education in the LIS courses in Indian universities can help to achieve the goal of enabling digital library use for e-learning. However, the analysis reveals that DLE in Indian schools is not updated with developments in the field. Our study being in close agreement with that of Varalakshmi (2009), besides information ownership shifting to information access, it makes a strong case to gradual shift to digital technology at different levels which can be achieved by revising present LIS and DLE curriculum in the light of changing and dynamic digital canvas becoming instrumental for e-scholarship in coming days.

**References**


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