A Comparative Study of the Impact of IT on LIS Education between a Developed Country and a Developing Country: An Indo-US Perspective

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The present study focuses on the impact of IT on LIS curricula of a developed country (USA) and a developing country (India). Analysing the brief past and present scenario of LIS education of both these countries, light has been thrown on the flagrant differences between the IT portions of the LIS curricula of the two countries. Finally upholding the constraints in the realm of India's IT education, a finger has been indicated towards the future of the LIS education in India.

Keywords: *Developed Country; Developing Country; IT on LIS Education; LIS Curriculum; USA; India.*

Introduction

"We had to address information technology in the ways we had not before and give the agents the tools that they need to do their job more efficiently and more expeditiously" -- Robert Mueller

These above words of famous American lawyer Robert Mueller can paint the canvas of today's library and information science world better than any other artist. Information technology (IT) has tremendously influenced and changed library and information services at libraries and information agencies. The library and information science (LIS) education is also influenced greatly by IT. IT is necessary to expedite the library operations as well as add efficiency in services. The LIS education professionals are also no exception in this

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regard. The current change in the LIS domain has brought a drastic reform regarding IT, in LIS educational pedagogies and instructional techniques. "The impacts of IT on LIS education involves the establishment of new curricula for LIS, new LIS course design, new ways to organize the LIS education, the different knowledge backgrounds and competencies of LIS faculty, extensive recruitments of LIS students, and the expanded job markets and career opportunities for LIS graduates. In addition, the impacts of IT on LIS education will generate challenges such as the changing educational/instructional environment, competition between LIS education and education from other related subject fields, IT based teaching/instructing techniques, comprehensive assessments of LIS courses compared with other courses, and increasing possibilities for collaborations among LIS educational institutions" (Hu, 2013).

In the present paper focusing on the impact of IT on the LIS curricula of a developed country i.e. USA (according to the Gross Domestic Product or GDP statistics of International Monetary Fund, World Bank and United Nations of 2014, USA has the numero uno status) and a developing country i.e. India (according to the Gross Domestic Product or GDP statistics of International Monetary Fund, World Bank and United Nations of 2014, India has the ninth rank) (List of countries by GDP, n.d.), an effort has been made to represent the flagrant differences between the IT portions of the LIS curricula of the two countries. Finally upholding the constraints in the realm of India's IT education, a finger has been indicated towards the future of the LIS education in India.

Developed and Developing Countries

Before going into the actual topic of discussion, a little light is thrown on the two economics related concepts which are "developed country" and "developing country". This has been done only because the study is going to compare the IT related parts of LIS curriculum of two countries belonging to these two above mentioned economic arenas.

A developed country, industrialized country, or "more economically developed country" (MEDC), is a sovereign state that has a highly developed economy and advanced technological infrastructure relative to other less industrialized nations. Most commonly, the criteria for evaluating the degree of economic development are gross domestic product (GDP), gross national product (GNP), the per capita icome, level of industrialization, amount of widespread infrastructure and general standard of living. In 2014, the ten largest advanced economies by GDP in both nominal and PPP terms were Australia, Canada, France, Germany, Italy, Japan, South Korea, Spain, the United Kingdom and the United States (Developed country, n.d.).

A developing country, also called a less developed country or underdeveloped country, is a nation with a less developed industrial base, and a low (HDI) relative to other countries. According to International Monetary Fund's World Economic Outlook Report, April 2015,Ê, Algeria, Bangladesh, Brazil, China, India, Nigeria, Pakistan, South Africa etc. are developing countries (Developing country, n.d.).

Library and Information Science

Library Science refers to "The professional knowledge and skill with which recorded information is selected, acquired, organized, stored, maintained, retrieved, and disseminated to meet the needs of a specific clientele, usually taught at a professional library school…."

Information Science deals with "The systematic study and analysis of the sources, development, collection, organization, dissemination, evaluation, use, and management of information in all its forms, including the channels (formal and informal) and technology used in its communication" (Reitz, 2002).

So, library and information science is the combination of library science and information science. Very often, library science is considered as traditional area of study and information science is regarded as advanced field of study that deals with different aspects of information, involving application of ICT (information and Communication Technology) to a great extent. Library and Information Science (LIS) provides education for library and information professionals and IT can be considered a tool subject to the core library science.

Impact of IT on LIS Education in USA

Brief History

In USA, the impact of IT on LIS education started to spread its wings since the late 1970's. With the advent

of MARC and slowly with the development of integrated library management software, OPAC and finally the growth of internet changed the whole scenario. In the 21st century which is better known as digital era shows a remarkable development in the domain of IT. The modern concepts of Cloud Computing, Big Data, Linked Data, RDBMS, Web Architecture, Web 2.0, Digital Library System and so on play a sublime role in the realm of LIS education. Various renowned professional associations based in the United States, such as the American Library Association (ALA), the Association of College and Research Libraries (ACRL), the Association for Information Science & Technology (ASIS&T) and the Association for Library and Information Science Education (ALISE) etc. have emphasised on the need and proper implementation of the recent IT related knowledge in the LIS education domain (Hu, 2013).

Present Scenario

According to the research made by Dr.Sharon Hu on the ALA accredited top 14 American LIS educational institutions ranked in 2013 by US News and World Report as the "2014 Best Library & Information Studies Schools", among the total number of LIS courses 33% (average) is IT related courses. Out of which Social Networking and Web based courses have a share of 28% whereas Digital Resources and Metadata related portion contains 26%. Computers, Networking and Programming contains 12 % and Database Design / System Management portion contains the rest 34% of the whole IT related part of the curriculum. For better understanding of Dr. Hu's research work, his table is provided below which will indicate the school wise statistics of the influence of IT on LIS curricula (Hu, 2013).

Rank by US News & World Report	University Name	Name of LIS School	Total Number of Courses listed in Catalog	Number of IT Courses (% of Total Number of Courses)	Web / Social Networks (% of Number of IT Courses)	Digital Resource/ Metadata (% of Number of IT Courses)	Computers /Networks /Programming (% of Number of IT Courses)	Database Design / System Management (% of Number of IT Courses)
1	University of Illinois, Urbana-Champaign	Graduate School of Library and Information Science	254	71 (28%)	22 (31%)	22 (31%)	8 (11%)	19 (27%)
2	University of North Carolina–Chapel Hill	School of Information and Library Science	137	43 (32%)	13 (30%)	12 (28%)	4 (10%)	14 (32%)
3	University of Washington	The Information School	125	39 (32%)	7 (18%)	8 (20%)	4 (11%)	20 (51%)
4	Syracuse University	School of Information Studies	106	51 (49%)	12 (23%)	11 (22%)	9 (18%)	19 (37%)
5	University of Michigan–Ann Arbor	School of Information	146	89 (62%)	21 (24%)	19 (22%)	24 (26%)	25 (28%)
6	Rutgers, the State University of New Jersey–New Brunswick	Department of Communication and Information Science	63	11 (18%)	2 (19%)	5 (43%)	2 (19%)	2 (19%)

7	University of Texas–Austin	School of Information	146	28 (20%)	6 (37%)	12 (21%)	3 (9%)	7 (33%)
8	Indiana University, Bloomington	School of Library and Information Science	102	33 (33%)	12 (36%)	7 (21%)	3 (10%)	11 (33%)
9	Simmons College	Graduate School of Library and Information Science	137	33 (24%)	12 (36%)	11 (34%)	1 (3%)	9 (27%)
10	Drexel University	College of Information Science and Technology	113	47 (42%)	14 (30%)	7 (15%)	10 (20%)	16 (35%)
11	University of Maryland, College Park	College of Information Studies	45	19 (43%)	6 (32%)	4 (22%)	2 (11%)	7 (35%)
12	University of Pittsburgh	School of Information Sciences	88	17 (20%)	3 (18%)	6 (36%)	1 (6%)	7 (40%)
13	Florida State University	School of Library and Information Studies	52	17(35%)	3 (18%)	3 (18%)	2 (11%)	9 (52%)
14	University of California--Los Angeles	Department of Information Studies	198	38 (20%)	17 (44%)	8 (22%)	0	13 (34%)
	Average % of IT Courses in Top 14 LIS Schools			**33%**	**28%**	**26%**	**12%**	**34%**

These data did significantly demonstrate the trend of LIS educational programmes for their curriculum design, i.e., increasingly implement and add IT courses. The above table clearly indicates that the higher ranked LIS schools devote a larger portion of their LIS curricula to IT.

Dr. Sharon Hu has also mentioned after reviewing information on the websites of these LIS schools that half of these LIS schools (7 of 14) offer IT related degrees from LIS school programs, or have merged together with Computer Science Programs or Information Technology Programmes. Recently, the School of Library and Information Science, Indiana University has merged with their Computer Science and Informatics programme. The School of Information, University of Michigan at Ann Arbor has changed to offer Master of Science in Information instead of the traditional Master of Library and Information Science; the University of Illinois at Urbana-Champaign has offered multiple IT based degree programmes such as Specialization in Data Curation, Socio-technical Data Analytics, Certificate of Advanced Study in Digital Libraries. The School of Information Studies at Syracuse University has offered "Master of Science in Telecommunications and Network Management", Certificates for Data Science, Digital Libraries, Information Systems and Telecommunication Management, and Global Enterprise Technology. The College of Information Science and Technology, Drexel University offered "Master of Science in Information Systems (MSIS)" and "Master of Science in Software Engineering (MSSE)". Half of these top 14 LIS Schools are members of WISE (Web-Based Information Science Education) and cooperate

and collaborate in LIS education through distance learning. The IT related courses through WISE could be shared and supplemented the faculty in different areas of skills and knowledge for IT and Information Science, in addition to meeting special needs from the LIS students. Successful collaborations in WISE are good examples to represent that IT courses enhance and implement the LIS Schools collaborations through online education (Hu, 2013).

From the survey of Hu, it becomes crystal clear that in the American LIS education IT has occupied a major portion and in the total amount of IT courses, almost one third portion is devoted to Database Design and System Management and almost one fourth portion is dedicated to Digital Resources and Metadata related subjects. Computer Networks and Programming related topics hold comparatively a little share of one seventh of the whole IT related courses. Tremendous emphasis on IT in the field of LIS education in USA has really helped the students of this discipline to become skillful and efficient LIS professionals.

Impact of IT on LIS Education in India

Brief History

After analysing the American scenario it is high time to cast a look on the LIS education in India. It is an American W.A. Borden who first initiated training in librarianship in India in 1911 at Baroda to create a cadre of men to man the newly established libraries in the state library system. From the pre-independence era to post –independence era, India saw a steady growth of LIS education through various Certificate, Bachelor's and then Master's degree courses organized by the various library associations and some renowned universities of India like Punjab University, University of Madras, Andhra Desha Library Association, Madras Library Association, Bengal Library Association, Benaras Hindu University, University of Delhi, University of Calcutta, Jadavpur University and so on. In 1949 University of Delhi first started Masters Degree in LIS education as well as PHD. Since then many other universities of India took the initiative to start teaching LIS education at Bachelor (B. Lib.Sc.), Master's (M.Lib.Sc.) and Doctorate (Ph.D) level (http://shodhganga.inflibnet.ac.in/bitstream/10603/1205/10/10_chapter%202.pdf)

It is reported that there were about 12 library schools in 1960s, imparting library science education in the country at all levels except the M.Phil. degree. The decade of 1960's saw some very important events taking place affecting LIS education in the country. Ranganthan conceptualised the premier education and research institute, Documentation Research and Training Centre (DRTC), Bangalore under the auspices of Indian Statistical Institute in 1962 for imparting a specialised training programme in documentation. Another parallel institution, Indian National Scientific Documentation Centre (INSDOC), now named as National Institute of Science Communication and Information Resources (NISCAIR), was established under the aegis of Council of Scientific and Industrial Research (CSIR), Delhi, in 1957. It started a course in Associateship in Documentation in 1964. Prior to this, it organised short-term training programmes for librarians which it continues to do as its objective of providing continuing education for LIS professionals. These are two premier institutions in the country providing specialised training in documentation and information and have been providing national input and support to the development of the profession in the country. They have updated their curriculum regularly keeping in tune with the changing time. M.Phil. degree in LIS education was introtuduced in India for the first time by the University of Delhi during 1970s. However, Certificate, Bachelor's Degree (BLIS), Master's Degree (MLIS), M.Phil. and Ph. D. Degree slowly become the main forte of LIS education of India and this tradition in still continuing (Kumar & Sharma, 2010).

With the objective of coping up with the changing scenario of the changing times the need of change in the syllabus was felt and for that many committees were formed namely **Ranganathan-Committee on Library Education (1960), Kaula Committee on Curriculum Development in LIS Education (1990), Karisiddappa Committee on Curriculum Development in LIS Education (2001).** Finally the **UGC Model Curriculum Committee (2001)** mainly dominated the curriculum

development part of the LIS education in India (http://shodhganga.inflibnet.ac.in/bitstream/10603/1205/10/10_chapter%202.pdf).

Early 1990s can be described as the period of modernization of library science when modernization of libraries started taking place. Government of India gave a thrust on the application of information technology, through various incentives. UGC also chipped in with liberal funding for establishing computer laboratories. Library schools started revising their curriculum, introducing courses on computer application in libraries, information science, and established computer laboratories for giving hands on experience to their students. This was also a period of consolidation. Microcomputers appeared on the scene in library activities and services during the 1980s. Accordingly, library schools began incorporating computers in the syllabi. University of Delhi was one of the first to introduce an optional paper on computer application that included Pascal programming language also. Initiation of automation activities and development of software packages in libraries started in 1990s. The fillip came from none other than UNESCO, when it gave the free software CDS/ISIS to libraries. Not only that, it provided expertise for training. International experts trained resource persons in the country. Simultaneously, custom designed and later proprietary software came into the market. LIS schools started incorporating LIS software in their curriculum. Initially, hands-on sessions were organised in the computer centre of the universities. Later departments started developing their own computer centres. Curriculum reforms also took place in 1992 with the directive coming from the **Curriculum Development Committee Report** (CDC) headed by Prof. P.N. Kaula, the doyen of LIS teachers. It recommended course contents for BLIS, MLIS as well as integrated two-year MLIS degree. In fact, it directed the universities to switch over to the integrated mode of education. The decade also gave birth to library and information networks (INFLIBNET, DELNET, CALIBNET, etc.) in India to overcome the increasing resource crunch.

Alongside, the developments in telecommunication technology were also slowly incorporated in the curriculum. LIS entered the new century with the CDC report in 2001, emphasised to face the onslaught of ICT. The report stressed on the need to have integrated two-year MLIS, gave new topics to be included in the curricula along with many optional subjects to allow the professionals to choose from alternative careers. University of Madras changed the name of their degree to Master of Science in Information Science dropping the term 'Library' altogether. A step further, International School of Information Management (ISIM) was esatablished to offer MTech and PhD degrees in information systems and management. It is a truly international venture with faculty from India and other countries. DRTC also revamped its curriculum, even changing the name of their degree to Master of Science (MS) in Information Science. The latest development is the introduction of e-education in which the IGNOU (Indira Gandhi National Open University) took the lead by introducing MLIS in the e-mode in 2008. IGNOU's Post Graduate Diploma in Library Automation and Networking (PGDLN) course of 1 year is also very significant in this regard.

National Knowledge Commission (NKC), set up by the Government of India, has recommended certain measures for the development of IT in LIS education in the country. These are:

- All departments of LIS should set up computer centres and well-equipped departmental libraries with appropriate teaching tools.
- E-learning materials for upgrading the skills of the existing staff should be provided.
- Teachers, who will teach in areas such as ICT applications in libraries and other modern methods, should have a specialisation in these areas (Kumar & Sharma, 2010).

Present Scenario

Recently there are 90 universities (Conventional /Regular), 31 Open Universities and Correspondence Course Institutions attached to Universities which are offering Library and Information Science Education at Master's level, 16 universities offering M.Phil in Library and Information Science and 59 universities at doctoral

level in India. In addition to these, two national level institutions namely National Institute of Science Communication and Information Resources (NISCAIR), New Delhi and Documentation Research and Training Centre (DRTC), Bangalore are offering two years integrated course in Associateship in Information Science equivalent to MLIS and two years integrated master's Degree programme on M.S. Library and Information Science (MSLIS) respectively. Very few universities are offering M.Sc. (Information studies/Information Science) equivalent to Master of Library and Information Science (http://shodhganga.inflibnet.ac.in/bitstream/10603/1205/10/10_chapter%202.pdf). Among the Indian universities, University of Delhi, Punjab University, Benaras Hindu University, Jadavpur University, University of Calcutta etc. hold prominent positions in teaching LIS courses.

In Indian universities as well as in the other institutions conducting LIS courses presently focuses on the following IT related areas like Information Technology Basics, Computers (Hardware, Software, Storage Devices, Input/Output Devices),Telecommunication, Networking, Library Automation, Digital Library, Internet, DBMS etc. These topics are taught both in theory as well as in practical. Though IT has been included in Bachelor's degree syllabus, it is largely prominent in Master's degree level (Kamila, 2008).

A Comparative Picture

There is doubtlessly a great gulf between the overall educational standards of USA and India. The LIS education is also no different. Studying the syllabus of various renowned and top ranked universities of India (with strong LIS departments) like Delhi University, Punjab University, Benaras Hindu University, Jadavpur University, University of Calcutta, Indira Gandhi National Open University (IGNOU) and obviously Documentation Research and Training Centre (DRTC, Bangalore), it comes to the front that at the Bachelor's Degree level the LIS curriculum of those universities only devotes approximately 11% portion of the total syllabus to the IT related courses. However, in Indian scenario the main IT related studies are included in the syllabus of Master's Degree level. In this level out of the total LIS syllabus 20 to 25% portion is devoted to IT related courses which is a bit lesser than the USA (33% of the total LIS courses are devoted to IT). Out of the total IT related courses, approximately 22% is devoted to Web related topics, Digital Resources, Digital Library and Metadata holds 12% (approx.), same is the amount with Networking and Programming Languages. DBMS holds 20% (approx.) of the total IT related courses. But all these are not closer in amount with the amount dedicated in the syllabi of American universities. As mentioned above the American LIS syllabi's IT portion dedicates 28% for Web/ Social Networking, 26% for Digital Resources/ Metadata, 12% for Network/ Programming and 34% for DBMS (DRTC MS Library and Information Science, n.d.; IGNOU MLIS Programmes, n.d.; University of Delhi, DLIS, n.d.).

Comparatively less emphasis on practical part of IT in LIS education also does not help much to the cause of Indian universities.

Again in USA some LIS schools have completely merged their courses with Computer Science and Information Technology (as has been mentioned above) for taking the LIS education to a new technological height but in India though DRTC has given much emphasis on IT rather than traditional LIS education, other universities have not taken such major steps yet.

Where does India Lag Behind

The hindrances in India's way of developing IT related courses in LIS curriculum are easily understandable. These are summarized below for a clear understanding of the readers.

- Lack of sufficient funding
- Inadequate technological infrastructure
- Lack of sound policy for curriculum development according to time
- Gap between job market and LIS curriculum
- Lack of technical support
- Lack of strong government initiative (Kamila, 2008).

Conclusion

India though a developing country, is a fast learner and has already drawn the attention of the world for its immense development in various sectors. India's education sector is not very poor if not strong like USA. IT sector in India is doubtlessly a matter of envy. India's fast growing economy, development of open access software and open access literature and various courseware in the LIS domain, establishment of various library and information networks like INFLIBNET, DELNET etc. and various institutional repositories like TKDL, Shodganga etc. as well as some open access LIS journals and various digital libraries, play a vital role in the growing stature of IT in the LIS domain.

LIS professionals do not need to become IT professionals like a computer engineer or computer scientist. But what is necessary for a LIS student is to achieve proficiency in IT issues related to present day library atmosphere. The knowledge of IT is nothing more than a survival strategy in today's IT dominated world. By giving more emphasis on the practical aspects of IT in LIS curricula, by sanctioning more funds and by giving more emphasis on IT infrastructure of LIS education centres, India can really make a havoc change in its standard of LIS education. Keeping a close eye on the changing syllabi of the LIS education of the developed countries will do no harm. It is neither easy, nor desirable to upgrade India's LIS curricula into that of USA's, but some changes can be done. No drastic changes can be done in one day. But only simple modifications and a little care on the part of LIS teachers and professionals will surely help India's LIS education to bask in the effulgence of modernity and universality.

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