

OCCASIONAL PUBLICATION 75



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The Occasional Publication series is published for the India International Centre by Cmde. (Retd.) R. Datta.

Designed and produced by Dee Kay Printers, 5/37A Kirti Nagar Indl. Area, New Delhi-15,
Tel.: 011-41425571, Email: dkprinter@gmail.com

**LIS Education in America:
The Present, the Past, and
the Future**

Elizabeth Cramer

LIS Education in America: The Present, the Past, and the Future*

In the United States, the Library and Information Science (LIS) degree is most often a graduate degree at the master's level. The degree is most commonly named the Masters of Library Science (MLS) or the Masters of Library and Information Science (MLIS).

In this paper, the author will discuss economic, demographic, and educational trends in the United States and how these trends are changing libraries. As libraries evolve to meet the needs of our communities, new sets of skills for librarians are emerging. The most important questions to ask about the future of LIS education—are we supplying LIS graduates with the appropriate training that ensures libraries remain relevant into the future? What is the future of the LIS degree? As libraries continue to evolve, will the LIS degree still be required or even desired?

Current Job Market for LIS Graduates in the United States

The United States is slowly recovering from an economic crisis that reached its height in 2009. While the economy has recovered up to a point, reductions have been significant and budgets are unlikely to return to pre-recession levels. As is the case for all countries, there is competition from alternative sources of information and information providers. Taxpayers, government officials, and university administrators are questioning the value of libraries in this time of Google and personal electronic devices. Our libraries, colleges, and universities are seeing a reduction in their funding and are being required to prove their accountability and worth to state and municipal legislatures and governing bodies. There is a wave of anti-intellectualism, anti-government, and fiscal conservatism among many of our citizens.

For a recent LIS graduate, obtaining a library job can be competitive. Library job growth is slower than average and recently, Forbes magazine ranked the

* Text of a lecture delivered by Elizabeth Cramer at the IIC, New Delhi, on 8 January 2016

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MLS as one of the worst graduate degrees for jobs. Libraries are facing budgetary constraints, hiring freezes, and the shift to part-time and/or non-professional positions. In academic libraries, there is more hiring of part-time or adjunct librarians, employees that do not receive the employment benefits or job security granted to full-time or tenured librarians. In public, school, and academic libraries, the trend is shifting from hiring LIS degree librarians to non-LIS degreed employees that possess alternative expertise such as sociology, education, public health, technology, and web design. To get a job, students need to receive a Library Science education that provides them with the professional skills that reflect the needs of their communities, changing technologies, and talent for leadership.

Demographic and Education Trends in the United States

Our communities in the United States are changing. They are becoming more diverse and increasingly technology and information-savvy. The population is growing rapidly, with a higher birth rate, a higher number of aged, and immigration. All of these factors have an effect on the economy and the environment.

With the gap between our older and younger communities, libraries are forced to examine our services and address the generation gap with conflicting interests. Libraries will need to meet the needs of an aging population with motor, visual, and/or other disabilities. And at the opposite end of the age spectrum, the future careers of US youth are increasingly technology-centered and reflect changing instructional needs. As our users become more tech-savvy, our MLS graduates need to be at the forefront of data and technology, so that they may offer instruction—both formal and informal—in social media, applications for personal devices, and effective information retrieval. Librarians, particularly those of us that have been in the profession for 20 years or more, need to adapt to understand and meet these technical needs.

As minority populations grow in the United States, libraries and librarians must be prepared to address the complex needs of increasingly diverse user groups. By the year 2050, minorities will be a higher percentage of the population in

the US than the traditional Anglo Population. Librarians must be prepared to address the needs of these diverse user groups, understanding their cultural norms and information needs.

Education is changing in the United States and it affects the role of libraries. One trend in higher education is Massive Open Online Courses (MOOCs) that allow anyone to enroll, either for free or for a fee. MOOCs rely on video lectures by professors, some student interaction, and online educational tools. One MOOC can have thousands of enrolled students, making personal contact with a professor virtually impossible. Questions remain about the librarians' role in supporting such large-scale distance education offerings. How can we best partner with our universities and instructors to support these massive courses?

Distance education and online learning are also affecting librarianship and LIS education in the United States. The availability of LIS online programmes has revolutionised the opportunity for many students to receive their MLS degree in the United States. Twenty years ago, there were only a limited number of universities offering the MLS degree and it was impossible to obtain the degree in many US states, particularly in the Western section. Now, students can receive their MLS degree online through more than 30 universities.

Library Education Reflects the Changes in our Communities

In the United States, as is the case for libraries throughout the world, the library's focus is on the user. But we are in the processes of re-defining who belongs within the community of users. Too often in the past, US libraries focused on serving the needs of long-time library users. Instead we must address the needs of the entire community we serve, to reach out to those unfamiliar with our services. As librarians, we need to ensure that our services are designed and implemented based on community input and not on traditional roles and limitations within our profession.

All types of libraries in the United States are re-examining their roles within their community and asking themselves how they need to change to remain

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relevant to their users. The truth is that circulation statistics of print book collections are dropping, more people are going to Google for their information needs, and reference librarian help desks are not being used as they were in the past.

In order to remain relevant, libraries are de-emphasising their print book collections. Many libraries are reducing the size of the library collections by 10-30 per cent. The space previously occupied by books is now being used as collaborative spaces where people can work alone or together to create new knowledge, new skills, and make use of available technology. One example of such a space is being called the 'maker space.' Simply stated, a library maker space is a place where people get together to make things. A maker space can be technology-rich and focus on STEM education (Science, Technology, Engineering, and Mathematics), or it can be a place for hobbies and crafts, such as knitting, sewing, bicycle repair, or a table full of LEGOs. Maker spaces are appearing in school, public, and academic libraries throughout the United States. In these spaces, patrons can work alone or collaboratively, often with assistance from library personnel and with tools or technology not readily available in most homes.

One big trend in maker spaces is 3-D printers. A 3-D printer is roughly the size of a breadbox with an opening in the middle. A tube moves back and forth inside, dabbing molten plastic into layers that harden, creating 3-D tactile objects, such as chess pieces, small-scale models, and replacement parts. A small object, the size of a smart phone, takes about an hour to complete. The 3-D printer, a 3-D scanner, and filament cost between \$4,000-\$5,000.

Maker spaces that are technology-rich draw many individuals to the library to try their hand at the new technology. Entrepreneurs and inventors are coming to libraries to produce prototypes and models. Students come to see something cool and are exposed to technology that embraces STEM education. In order for librarians to be experts in these new technologies, considerable education and training is required—education and training that should be included in the course offerings for the LIS degree.

Technology in ILS Education

The world and libraries are becoming more tech-savvy. Technology is becoming increasingly integrated into our everyday lives through cloud computing, the Internet, and gathering information through Google via our smart phone, personal tablet, or computer. Information professionals must be comfortable with technology and have a desire to always adapt and update their skills. They should be eager to learn how to use new devices, be comfortable with social media platforms, apps, analysing data, and developing coding skills. And they should be able to train others to use a variety of technologies.

This increase in technology has led to the proliferation of the iSchool in the United States. iSchools are rapidly replacing MLS programmes and focus on specific tracks such as information technology, library science, informatics, and information science. Currently in the US, 46 ILS educational institutions now self-identify as iSchools, with a significant increase in the number of information technology related courses in the curriculum.

Looking at the names of the MLS programmes ranked as the top five in the US, one can see the change in focus from libraries to information:

- School of Library and Information Studies (Univ. of Ill., Urbana-Champagne)
- School of Information and Library Science (UNC-Chapel Hill)
- The Information School 'iSchool' (Univ. of Washington)
- School of Information Studies (Syracuse)
- School of Information (Univ. of Mich.)

New Library Skills Required for New Library Positions

In the past, there were two main career paths for the librarian. You could either go into Public Services to become a reference librarian, or you could go into the Technical Services branch and become a cataloguer. All IT personnel at the time seemed to evolve out of the Technical Services branch and they mainly worked with the library's ILS system. But now, things have drastically changed

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due to the current trends in libraries. This list of positions currently advertised within the United States demonstrates the great variety of new positions in libraries requiring a much wider array of technical skills.

- Maker Space Librarian
- Emerging and Instructional Technology Librarian
- Digital Librarian
- Data Librarian
- Assessment Librarian

Many academic and some public libraries are putting a lot of their resources (money and staff) into the digitisation of their 'hidden' special collections, making these items available to the world via the web. Digital curation includes the work of selecting, preserving, maintaining, and archiving digital assets. This represents a whole new set of skills that did not exist in libraries 20, even ten years ago.

Other new career paths are the 'data librarian,' 'assessment librarian,' or other forms of information professionals who work with data. One major shift in U.S. libraries is that our administrative and governing bodies are now holding us accountable. Libraries are collecting their own data in order to assess and prove our impact and value. In addition, it is required that all researchers that receive federally funded grants make their data openly available. Libraries are helping researchers to format and store this data, plus acquiring the expertise to manipulate the data.

In addition to technical skills, librarians must learn 'soft skills' to connect with their communities and with their colleagues. The University of Maryland's iSchool has recently issued a report titled, *Re-Envisioning the MLS: Findings, Issues, and Considerations* (Bertot, Sarin and Percell, 2015), summarising their research into the attributes of successful professionals.

In their report, they state that library professionals must thrive on change, embrace public service, and seek challenges that require creative solutions. They need to have strong leadership and management skills, with the ability to

communicate and effectively address the changing needs of organisations. They should possess a strong knowledge of fundraising, budgeting, and policy-making skills.

Information professionals need to know how to advocate on behalf of their organisations and communities through contact with government officials, trustees, and other administrative bodies. They also need to know how to market the library as a valuable community resource. This requires a willingness to engage in constant and ongoing analysis and change, supported by documentation and assessment of programmes that prove the library's impact.

Instructional skills are another desired quality of the MLS graduate in the US. No longer is the library a place for individuals that desire to work alone in the back rooms of the library. Librarians need to be able to facilitate learning and education either through direct instruction or other interactions. They should possess a strong desire to work with the public and need to be collaborative problem solvers. The reference help desk is not used as it was in the past and academic reference librarians need to adapt to new models, working as 'library liaisons' that proactively reach out to students and faculty.

Information professionals must be creative and critical thinkers, willing to try new things. They should be willing to take risks, create new programmes, not afraid of failure. They must actively seek information about trends and best practices. They must be willing to let go of the past and create the future, working to foresee users needs 5, 10, 15 years from now.

But perhaps most importantly, MLS graduates need to be adaptable. Librarians must be willing and eager to continually learn and adapt to new needs and services. They must be comfortable with ambiguity and uncertainty and be willing to continuously learn new skills

The Future is Libraries. But What About Librarians?

According to the report, *Re-Envisioning the MLS*, survey results gathered from library professionals reflect a sense that an MLS degree is not always required for all aspects of library work. Specific examples may include jobs requiring expertise in human resources, information technology, and web design.

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Yet for leadership positions in libraries, the general consensus among librarians is that individuals need the MLS degree for the overall understanding of librarianship and the information professions, and our core values such as intellectual freedom, privacy, access, equity/social justice, open government/ civic participation, and learning.

Some indicated that an MLS wasn't always sufficient for some positions, and perhaps was best pursued in addition to core subjects in which a student passed his graduation or PG course. For instance, a Humanities Librarian may need an advanced degree in art, literature, or history. Additional specialised areas included education and instruction backgrounds and degrees, those with skill in design and creative activities to work in maker spaces, and individuals with social service related backgrounds.

In summary, there are big changes on the horizon for Library Science education in the United States. Libraries need to evolve to remain relevant to the communities they serve and LIS education needs to adapt as well. The day of the reference and cataloging paradigm is gone. Instead we are ushering in a new generation of tech-savvy, collaborative, and courageous librarians that are able to adapt in an ever-changing and sometimes disruptive reality.

Reference

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Bio-data

Dr. Elizabeth Cramer is a Coordinator, Bibliographic Services, Belk Library and Information Commons, Appalachian State University, Boone, NC 28608.

Education for Information Studies in India

K.S. Raghavan

Education for Information Studies in India*

'Start swimming or you'll sink like a stone ... the times are changing'

— Bob Dylan

1. Introduction

Nations, societies and institutions of all kinds are in a state of flux as a result of the impact of globalisation and the Internet. There have been recognisable and fundamental changes in the past one decade and more in the ways in which we work, conduct our daily lives and our interactions with others. The changes are too strong and rapid and many of the most visible changes are fueled by developments in information and communication technologies (ICT) – computers, smart phones, and the World Wide Web. These technologies boost our capability to access, to process, store, retrieve, and communicate information and have fundamentally changed the way we engage in work and recreation. Today's world is more networked than ever and countries and communities are much more interdependent on each other as a direct consequence of globalisation, which itself is a product of developments in technology. The far-reaching developments brought about by technology in the past two decades have transformed the workplace, which is very different from what it was before the advent of this technology. This is true of practically every kind of institution—manufacturing industries, banks, schools, hotels, airlines, shops, governments, libraries, etc. Given this, there is naturally a growing concern of a possible *mismatch* between professional education programmes and the requirements of the job market. Therefore, critical attention is being paid to all aspects of higher education with a view to generate manpower with knowledge and skills required for and relevant to the emerging situation. Practically in every country in the world, higher education in general and professional education in particular has come under critical review in recent years. Even as

* Text of a lecture delivered by K.S. Raghavan at the India International Centre, New Delhi, on 8 January 2016

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there are extensive discussions and debates on the continued relevance of the present system of professional education to the needs of the society at large, the structure and traditions of the higher education system, particularly in developing countries such as India resist changes to the existing models. The industry, which is the principal employer of products of professional education programmes, has, in recent years, pointed out that India's undergraduate and graduate education programmes are too *theoretical* and are devoid of practical experience necessary for absorption into the industry's workforce.

A report by the Indian software industry group NASCOM (National Association of Software and Services Companies) published a few years ago suggested: '75 per cent engineering students in India are unemployable'.^[1] The major Indian IT firms reject 90 percent of college graduates and 75 percent of engineers who apply for jobs because they are not 'good enough to be trained'. Many large corporate houses such as Infosys have substantially increased the duration of training of new recruits to the company.^[2] Leaders in certain kinds of industries, e.g., the hospitality industry have established their own training schools outside the mainstream higher education system.^[3] These are clear indications that there is a widening of the gap between products of the higher education system and requirements of the emerging job market. Given this, it is important for all those concerned with professional education to reconsider traditional approaches and look for ways to modernise professional education in terms of both content and methodology to make it meaningful and relevant to the present and emerging scheme of things. Education for information and library professionals is no exception to this. It should not therefore come as a surprise that in the last one decade and more many countries have set up mechanisms to review their professional education programmes in information studies and to suggest future direction.^[4] The U.S.A. saw the famous KALIPER report; Japan initiated the LIPER project; the European Union also initiated a major programme. The University of North Carolina at Chapel Hill, USA even organised a seminar that brought together 'thought leaders in the diverse information field to create a blueprint for educating the next generation of information professionals'. The papers

have been published as a volume, *Information Professionals 2050: Educational Possibilities and Pathways*.^[5] Coming to India, we saw the setting up of two curriculum development committees for LIS education (CDCs) by the University Grants Commission in the 1990s, the constitution of the National Knowledge Commission (NKC) by the Government of India and more recently, the committee to 'Advise the Government on Renovation and Rejuvenation of Higher Education'.

Redesigning education for the information professions is indeed a tall order. For one thing, in recent decades there seem to be competing departments and educational programmes even within a single university, all of which aspire and claim to train *information professionals*. Traditionally, schools of librarianship trained library professionals. This has been so since Melville Dewey established the first university school of librarianship in Columbia in 1883. Over time, however, these schools have undergone changes in their nomenclature and programmes, to become schools of library science, schools of library and information science (LIS), schools of information and library science, schools of information studies / information science, schools of information resource management, etc. The most recent addition to this is the *I-school*. Today in many developed countries of the world most information professionals come out of these I-Schools. We shall return to this subject a little later. All these developments have added to the complexity of the problem on hand, viz., planning education of information professionals for the future. Irrespective of the name by which a school goes, it is important to remember that all education programmes for training information professionals must necessarily draw their broad purpose, goals and values from those of librarianship.

Planning professional education programmes for the future require that we have an idea, even if it is not a very clear picture, of the emerging future. What makes this particularly difficult in the information and library arena is that the technologies that are driving the changes in the information arena are disruptive technologies.^[6] These technologies have fundamentally affected and altered almost all information-related tasks including its generation, storage, search, access, dissemination, organisation, etc.

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2. LIS Education in India: Education for librarianship in India has a fairly long history. As early as in 1911, in the erstwhile princely state of Baroda, William Borden, an American librarian who was appointed as the state's library director, introduced a training programme to meet the manpower needs of the public library system that the ruler of the state, Maharaja Sayaji Rao Gaekwad had established in the state. In 1915, a training programme was established in the Punjab University at Lahore. However, education for librarianship at the post-graduate level started in India in 1937 with the introduction of the Post-Graduate Diploma programme in the University of Madras under the direction of Dr. S.R. Ranganathan. Diploma programmes on lines similar to the University of Madras programme were started in four other universities in the 1940s:

- BHU – 1941
- University of Bombay – 1944
- University of Calcutta – 1946
- University of Delhi - 1947

The University of Delhi instituted the master's degree programme in library science in 1948 that served as a model for other universities in so far as course contents for Master's programmes were concerned. Today there are about 150 higher educational institutions in the country offering programmes in LIS. In addition many polytechnics, professional library associations offer Diploma / Certificate programmes. Much has been written and said about LIS education in India:

- *JELIS* brought out a special issue on LIS education in the Asia-Pacific region in 2007;
- *Cataloging and Classification Quarterly* brought out a special issue in 2009 on Education for Knowledge Organisation;

- Papers and talks at the annual conferences of the IATLIS have also addressed the subject; Recently IATLIS had organised a seminar on 100 years of LIS education in South Asia

In India, to a very large extent, information science education has been coextensive with LIS education, even though in recent decades some higher educational institutions have started programmes—notably *information science* programmes in colleges of engineering and technology usually organised around schools of computer science and engineering, and programmes in *information systems* in some business schools. However, university schools of LIS continue to be the principal and major suppliers of manpower to libraries and information centres and these will be the focus of this paper.

3. Environmental Changes

The course contents and structure of the university programmes in LIS have largely been influenced by the reports of the UGC committees (Ranganathan Committee, Kaula Committee, and Karisiddappa Committee). However, little has changed if we consider the structure of and approach to education in our universities in 2015 as compared to what it was 50 years ago. Most LIS schools still base their course contents on the model of what was suggested in the 1965 UGC Review Committee report.^[7] The reports of the subsequent committees have largely rephrased and updated the course contents recommended in the original report of the UGC Review Committee (that was chaired by S.R. Ranganathan). There has not been any serious effort to re-examine afresh the issue of education for LIS in the light of the developments that have taken place especially since the advent of the Web. What I propose to do here is to look at the subject of education for information studies from the perspective of the world we live in today.

Ideally, education for a profession should encompass the world of professional practice in all its forms; for it is in the world of work that knowledge and skills are applied, it is the world of work that defines the nature of skills and knowledge

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required by recognising the need for new knowledge and skills; also, new knowledge often takes shape in the world of work. When education programmes in librarianship were designed and introduced in this country (and elsewhere), the designers of the programme had in mind the library as the institution of professional practice; the print media was seen as the primary mode of recording, preserving and communicating knowledge; the user was seen as one who visited the library when in need of some documentary resources. The library catalogue (and printed bibliographies) was the principal instrument used for searching for information.

In the course of the transition from an analog to a digital environment, all these have changed. It is important to realise that the nature and extent of changes that the digital revolution has brought about are fundamentally different from the changes that the phase of library automation that began in the 1960s with the application of computers to libraries brought about. In the phase of library automation, computers were seen as tools for enhancing the efficiency of the library; to carry out certain library operations in a more effective and efficient manner. The phase of library automation did not see questions being raised about the need for or relevance of conventional libraries. In the present digital age even the very relevance of conventional libraries is being questioned. The *Wall Street Journal* carried an item with the caption, '*Do people need libraries in the digital age?*' in 2014 (see the screenshot). While one need not necessarily agree with the argument or suggestion made in this article, it is important to take note of some major implications of such questions that are being increasingly heard:

- The traditional library is no longer the only or even the principal mechanism for people to find and access the information / information resources they need; several mechanisms have come into being, especially since the advent of the Web that threaten to replace the conventional library or function in parallel limiting the role of the conventional library. Web search engines, social media and even the

knowledge management systems that have come to be established in large corporate houses, are among such mechanisms;

- Even if the library continues to be an important link in the communication process, it necessarily has to alter and modify its functioning so as to remain relevant in the rapidly changing information environment; i.e. the library has to reinvent itself;



Fig.1 Screenshot of *Wall Street Journal*

Even as we recognise the fact that dealing with *change* is not something new for information professionals, the rate at which changes are taking place since the advent of the Web and digital technologies has been incredible and mind-boggling; not only this, the nature of changes have been fundamental and sweeping, raising many questions and suggesting the need for a broad-based approach to design of education programmes for information professionals. In the following paragraphs we will briefly visit some of the major changes:

- Information overload is certainly not a new phenomenon. We heard it being referred to as *information explosion* in the years after the 2nd World War. Today there is a data deluge and the amount of information is much

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more than we can absorb and meaningfully handle. The solutions being proposed to manage this are all technology-based: data visualisation, data analytics, and data mining.

- The mechanisms used for publishing and delivery of information are expanding;
 - To look at just the academy concerned with higher education and research, the *Open Access* movement is transforming scholarly communication in a major way;
 - Information is packaged and delivered in an extremely wide range of formats and containers / carriers;

Not very long ago, libraries began adjusting to the shift from possessing hard copies to accessing e-versions for a fee. Today libraries, especially academic and research libraries are faced with a new model of scholarly communication led by the *open access* movement. There is an uneven relationship between commercial publishers and open access publishers. The pricing policy of commercial publishers—both of e-books and e-journals (as well as their print versions) has, in recent years, severely affected the library's ability to acquire access to these resources. Different *open access* models are being proposed and discussed; e.g., commercial journal publishers have made certain proposals; the community, which in the first place initiated the open access movement, seems to have very different ideas. Whatever shape and form the movement will take, there is no question that it will affect and alter scholarly communication in a big way impacting libraries.

- Changes have taken place in the library technology landscape resulting in libraries moving away from the print-dominated models of management, discovery and access to their resources and adopting new products that clearly recognise the importance of e-resources and make possible a more unified approach to resources within and outside the library including licensed e-content; they also enable libraries to take advantage of shared metadata and resources available on institutional repositories;

- The makeup of information users in the 21st Century is very different from that of users of the pre-web era. For one thing, the end users are regular and heavy users of technology and have much higher expectations from information systems; they are quite familiar with other players such as search engines and social media like Facebook, who are a part of the information space. The level of information literacy and much greater expectations of information users have been enabled by these new technologies (e.g., Google) and social media (e.g., Facebook). In other words the users will be *digital natives*; it is important to recall here the findings of the two surveys carried out by OCLC on users' perceptions of libraries that are clearly indicative of the trends;^[8,9]
- More importantly, we need to take note of the emergence of the knowledge / information society and the impact of globalisation. This is what Thomas Friedman, renowned journalist, has referred to as the *Flat World* phenomenon resulting in increasing leveling-off of competition and capabilities across the world. A direct consequence of this is the transformation of the work place affecting practically every sector: shopping, banking, travel and holiday (e-commerce websites); administration (e-governance practices) and extensive use of information technology for documenting, preservation and transmission of documents of all kinds (E.g., land records, identity documents, palm leaf manuscripts, printed books, films, audio and video records, etc.). Large corporations seeking to leverage the knowledge within the enterprise to their advantage have built enterprise knowledge management systems. These developments have resulted in a widening of the scope of the areas for application of techniques employed for organisation and processing of information, indexing to support search and retrieval, etc. Driven by the ICT revolution and the increased mobility of capital, globalisation is widely seen to have the potential to accelerate the process of poverty reduction in emerging

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economies like Brazil, China, India and South Africa. Developing countries such as India also need to take cognisance of the possible negative aspects of globalisation.

- The information industry that generates information products and services has emerged as an important player in information transmission, packaging, analytics and dissemination. While in India, the industry is yet to have any major presence, it is important to note that in the networked world and globalised economy, many of the knowledge processes are outsourced especially to developing countries (*flat world* phenomenon). The physical place of location of the *information professional* is not necessarily a factor that will affect the nature of work expected or the agency that the person works for.

Two major inferences need to be drawn from the preceding brief review of the developments that have taken place in the *information arena* both of which need to be seriously considered by those concerned with planning educational programmes in information studies. Firstly, education programmes need to realise the enormous and fundamental changes that have taken place in the way libraries function that impact the nature of manpower needed to manage modern libraries in terms of knowledge and skills required. Secondly, today there are environments and workplaces outside the conventional library requiring manpower with knowledge and skills in *information work and service*. Planners also need to take cognisance of this broadened information environment, identify the knowledge and skills required to work in such environments and workplaces and build appropriate components into education programmes designed to train information professionals.

4. Developments in India

Having looked at some of the major environmental changes that have taken place, let us briefly focus on the related movements and developments in India coming as a reaction to such global developments:

4.1 Globalisation

While globalisation has had a positive impact on improving the living standards of the middle class in India, globalisation also carries with it the danger of creating a market place in knowledge that excludes the poor and the disadvantaged; particularly individuals and households that do not have access to basic education and ICTs. In an increasingly knowledge-based global economy, there is thus the danger of a deepening marginalisation within a rapidly growing economy. What is important is to shape and manage the process so as to ensure equity and sustainability, thus maximising its benefits to all sections of the society and minimising the risks of exclusion of certain sections of the society. The Government of India and also the governments at lower levels have initiated a number of programmes aimed both at bringing the marginalised communities into the mainstream, as also reaching the benefits of the IT revolution to as wide a section of the population as possible. While the infrastructure required for this in terms of technology appears to be more or less in place, there are several other gaps that need to be addressed. Some of the initiatives to address the issues are: *Digital India*, literacy programmes (e.g. National Literacy Mission), the National Manuscripts Mission, projects aimed at documentation of indigenous knowledge, programmes aimed at information empowerment of the marginalised, dissemination of information to enhance agricultural productivity, programmes aimed at creation of content in Indian languages and scripts and relevant to the needs of the society, etc. These represent a potential area for application of information skills;

4.2 E-Governance

Another major change that has already been initiated and will play a major role in determining the nature and shape of the information arena in India has to do with governance at various levels. The Government of India and some state governments have also passed the 'right to information' act making it mandatory for government departments to make available certain kinds of governmental information to citizens on demand. There have also been efforts to digitise official records (e.g. The Bhoomi project of the Government of

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Karnataka to digitise land records); the census data are already available in electronic form. A major policy initiative of the Government of India is the Common Service Centres (CSCs), broadband-enabled computer kiosks that will offer a range of 'Government to citizen' and 'business to customer' services. The CSC is a strategic cornerstone of the National e-Governance Plan (NeGP) expected to offer a bouquet of web-enabled e-governance services in rural areas.^[10]

There is today an abundance of information available on the Web (a phenomenon often referred to as *information overload*). There is, at the same time, a dearth of relevant information for certain countries / communities. It is indeed a paradoxical situation that in India and many other developing countries and less developed countries of the world, information overload and information scarcity co-exist. For example, the World Wide Web predominantly has information in English and other Latin-based languages. Of course, the volume of information on the Internet in languages such as Chinese, Arabic, etc. is growing. For a multilingual, multi-script country as India, there is not much information on the Web in the languages and scripts of the country. While the initiatives mentioned above are significant, what remains to be done is huge and complex given the size and diversity of the country and also given the requirement that what is digitised needs to be made easily and efficiently searchable. These have resulted in the emergence of new information work environments requiring relevant digital content creation in local languages, development of digital libraries in local languages and also requiring a considerable amount of value addition work.

4.3 Library Scenario

Libraries are increasingly becoming a fusion of physical and virtual realms. When we consider the library as an institution, an important issue is whether we are seeing the library as a physical space or primarily as a mechanism that facilitates access to needed information resources. Surely there are indications that the view of the library merely as a physical space to visit when some information is required is losing ground. Libraries have moved away from the

print-on-paper dominated models of management, discovery and access to in-house resources to a more unified approach that recognises the dominant role of electronic resources, digital collections, and diminishing reliance on print materials. Libraries in India, in so far as academic, research and special libraries are concerned, are comparable to their counterparts elsewhere in terms of level of automation attained, provision of specialised services, building digital repositories, providing access to e-resources, etc. However, the same cannot be said of public libraries and school libraries where India still lags far behind the more developed countries:

- Public library services and school library services: There is a great deal of variation in public library development and quality of public library services in different states of the country. Some of the states where library legislation is in force have made considerable progress while in other states the public library situation remains bad. Barring a few exceptions, there are hardly any school libraries worth mentioning. A factor that has hindered the development of school and public libraries is that the governments at the state level are largely responsible for funding these. To overcome this problem to some extent, the Ministry of Culture of the Government of India established the Raja Rammohun Roy Library Foundation (RRRLF) that funds public libraries in all the states through the respective state library authorities. However, the other information technology based information support services of the Government of India are operated and managed by other ministries such as the Ministry of IT. With a little bit of planning and coordination, the *Digital India* plan could have been linked to public libraries at least in states with public library legislation and the CSCs could have been housed in public libraries. It is indeed very difficult to think of a more suitable and appropriate agency than the local public library to house CSCs and to serve as a portal for services to be provided under the *Digital India* programme. Hopefully, things will change both in respect of public libraries and school libraries necessitating a demand for manpower with appropriate skills and knowledge;

4.4 Job Market

The principal job market for products of LIS programmes was libraries, particularly academic and research libraries, special libraries attached to R and D laboratories – mainly in the public sector. This situation no longer exists. Large corporate houses have built knowledge management systems to harness enterprise knowledge. Some studies on the library / information job market in the country have been reported. A microanalysis of job notifications (2007-2008) in the media as also the outcome of a destination and questionnaire survey of graduates suggest that:[Raghavan & Agrawal, 2006; 409-415]; [Raghavan & Giri, 2009]

- Information job market is diversifying;
- The gap between knowledge and skills acquired in LIS schools and those required by the job market is widening;
- Many entry-level jobs in libraries are getting de-professionalised with the increasing levels of automation of libraries;
- People seeking jobs need different skills to become employable.

4.5 Information Industry

The information industry in India is yet to emerge as a major player in the global information arena. Given the low cost of hiring skilled manpower in India, this area has the potential to become a major player and employer of the information workforce.

4.6 In planning education programmes for information manpower development in the country all the factors discussed in sections 4.1 through 4.5 above should be taken into consideration. What has happened in the last couple of decades especially since the advent of the Web and the emergence of the ideas of *information society* and *knowledge society* is that governments, institutions and societies at large are reinterpreting and redefining problems in terms of *information* and *access to information*. This has resulted in a broad landscape at the intersection of information, society, and technology, which includes

libraries but is not limited to libraries. The physical and organisational forms of libraries and other *memory institutions* have also evolved and have undergone significant changes. Given the importance being attached by governments and organisations to transform the society into a *knowledge society*, it is likely that the landscape will expand further generating a demand from a wide range of organisations for information professionals. The employment market will expand and entrepreneurial opportunities will emerge. What will, however, unite all these information professions even as the landscape widens, is the fact that the goal of the information professions be it in a library or outside, will continue to be governed by the Five Laws of Library Science of S.R. Ranganathan—to maximise the use of information by connecting people to information in an efficient and meaningful manner.

5. Education Programmes for the Information Professions

In planning for anything, it is important to be futuristic. The preceding sections of this paper have reviewed the rapidly transforming information landscape.

While it is difficult to accurately predict the information world of the future, such an exercise is essential to avoid being caught totally unaware. As far as India is concerned, general vision documents / forecasts and recommendations as well as forecasts for certain specific sectors exist (Dr. Abdul Kalam's India 2020 vision document, Dr. M. S. Swaminathan's documents for the food and agriculture sector, the report of the National Knowledge Commission (NKC), to mention a few). We need to formulate an idea of the nature of information work, products and services expected of information professionals, say, 15 or 20 years from now. 'What external drivers will transform information dissemination and how' is an important question in developing an approach to designing educational programmes. It is indeed very difficult to predict the nature of information manpower that will be required in the not-so-near future. Undoubtedly socio-economic, political and technological developments will all impact and determine the nature of information manpower required. Some of the developments will necessarily be country-specific while others will be global in nature determined by changes in information technology and in the

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information landscape. One thing that is absolutely certain is that in planning education programmes for information manpower we need to look at the requirements of a wide range of institutions and environments and our programmes should not be restricted to manpower needs of libraries and similar *memory* institutions. Information work is relevant even outside the library and it is in this sense that we refer to the broader *information professions*. We also need to realise that the requirements of these *memory* institutions and the way these are managed and run have also substantially changed as a result of changes in the information landscape and application of technology. To briefly summarise the principal factors:

- The environment in which information professionals operate has undergone and continues to undergo fundamental changes;
- Technology has completely changed methods of information storage and retrieval that have endured for centuries. Scholarly communication has been transformed;
- Information permeates all aspects of our lives as we move from a world where information was stored in finite containers such as books and filing cabinets to one where information is virtual and omnipresent;
- The end-users' expectations are changing.

In addition to issues related to preparing information professionals for a diversifying job market which adopts a profession-oriented approach and views the educational programmes in terms of a field of practice (similar to medicine and law), it is also important to keep in mind the fact that the role of a higher education institution is not limited to the task of training professionals to fit into certain kinds of job positions. A university school has a number of other roles including carrying out research, preparing students for life-long learning, to be innovative, etc. Ideally a higher education system should function as a transformation force. Any plan for education programmes for the information professions should therefore have an appropriate mix of theory and practice. This is where the *i-school* movement that originated in US provides useful inputs. Today, in the US, most information professionals graduate from these i-

schools, which offer courses that are a blend of theory and practice. When i-schools were established, one of their major goals was to find an identity for the discipline of *Information Studies* within the higher education system on par with that enjoyed by the more established disciplines. I-schools seek to study *information* without reference to any institution of practice so as to build a '*Science of Information*'. Looking into the development of I-Schools especially in the U.S. it is seen that they have arisen in three principal ways:

- By restructuring existing schools to meet the demands of the new information society;
- By merging different and disparate existing programmes / schools to create a new entity;
- By creating an entirely new entity with new inter-disciplinary programmes and faculty

Each one of these approaches has brought different challenges in terms of, e.g., individual biases, identity and focus derived from the dominant section of the faculty, competing visions of the future among different sections of the I-school faculty, etc. Clearly there are lessons for us in India to learn from their experience as the I-school movement is still in its infant stage in India. Clearly the discipline of information studies is inter-disciplinary in nature and we only have a hazy idea of its composition. Chaim Zins' knowledge map of *information science* that is based on a Delphi study using an international panel of 57 experts from 16 countries presents a systematic knowledge map of *information science* that consists of the following top categories:[Zins, 2007; 526-535]

- *Foundations*
- *Resources*
- *Knowledge Workers*
- *Contents*
- *Applications*
- *Operations and Processes*
- *Technologies*

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- *Environments*
- *Organisations, and*
- *Users*

It has been suggested that the above model establishes the 'groundwork for formulating theories of information science, as well as developing and evaluating information science academic programmes'. Marcia Bates' idea of the composition of *information sciences* (as she prefers to call it) is represented by the following cloud.[Bates, 2007]

The representations above reiterate the suggestion that course contents can no longer be linked to a single type of potential employer, viz., the library. The need for professionals to staff the libraries that are housed in universities, corporations and communities will continue. However, *Information Studies* is not and should not be limited to libraries / and librarians. It is possible that things may further evolve in future. For example, information work in certain domains may get so specialised leading to independent sub-disciplines within those domains, e.g., Health Informatics, Legal Informatics, Enterprise Knowledge Management, etc.

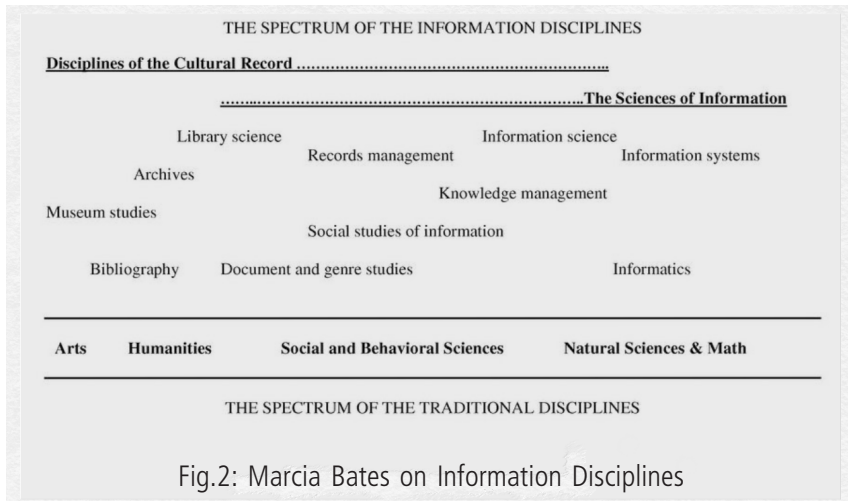


Fig.2: Marcia Bates on Information Disciplines

Should such a situation emerge, I-schools will need to identify that segment of the information market place in which their products can play a meaningful and useful role. Clearly there are and will be competing agencies (Computer

Science schools, Business schools, etc). The factors that should determine the contents of an education programme in information studies in India are:

- The potential workplaces / environments;
- The fields of work: e.g. management, indexing, information search;
- The skills: cultural and social skills, IT;

In addition the schools in India should also have a research agenda that will, among other things, research into:

- Nature of indigenous knowledge systems;
- Information needs of marginalised and disadvantaged communities;
- Information access as a societal responsibility; meaningful and relevant content in local languages and scripts (Bridge the digital divide);
- Information access and information services and products as a global business opportunity.

Information ecology and the industry of today and tomorrow is transforming the roles that our profession can play and must play if it is to occupy a place of significance in the lives of our communities, businesses and institutions of learning. Surely education for information studies is at crossroads and this is the most appropriate time to formulate strategies to shape it as a force for transformation.

Notes:

1. <http://news.in.msn.com/nationalarticle.aspx?cpdocumentid=3371322> (accessed 10th November 2009).
2. Beginning this year new recruits to Infosys undergo 29 weeks (i.e. 7 months) of training before they are put on a regular job.
3. Big hotel chains like the Oberoi, Taj and ITC have opened their own schools outside the formal higher education system where the students are trained as per their (industry's) needs and requirements.
4. We will use the term *Information studies* in a broad sense to include all those areas coming under what have been called Librarianship, Library Science, Library & Information Science, Information Studies,

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Archival Sciences, Documentation, and Knowledge and Information Management.

5. *Information Professionals 2050: Educational Possibilities and Pathways*.
6. According to Clayton M. Christensen, a Harvard Business School Professor a disruptive technology is a new technology that unexpectedly displaces an established one. Christensen used this term for the first time in his 1997 book entitled 'The Innovator's Dilemma'.
7. There were a few notable exceptions to this; the Master's degree programmes of the Bombay University (now Mumbai University) and Mysore University treaded a somewhat different path when they were initiated although the more recent revisions seem to be similar to what most other universities have adopted.
8. OCLC(2011). *Perceptions of Libraries, 2010: Context and Community*. – Dublin (Ohio): OCLC, 2011
9. OCLC (2005). *Perceptions of libraries and information resources*. – Dublin (Ohio): OCLC
10. <https://www.csc.gov.in/index> (accessed on 3rd March 2016).

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**Global Trends in
Education for
Information Studies:
A Note**

K.S. Raghavan

Global Trends in Education for Information Studies

A Note

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This is not intended to be a comprehensive review of global trends in education for information studies. There are several relevant documents and the one that is particularly noteworthy is the document that is the outcome of a symposium organised by the Graduate School of Information and Library Science of the University of North Carolina at Chapel Hill, USA. [Marchionini & Moran (eds), 2012] This is particularly useful in getting an overview of the emerging trends, and even more importantly, the line of thinking and approach prevalent among educators with particular reference to USA (equally applicable to other countries of the developed world). In so far as countries in Eastern Europe, the Far East, Southeast Asia, Middle East and South Asia are concerned, there is a great deal of variation among the countries. Schools in some countries such as Thailand continue to view libraries as the primary work place for their graduates, where as Singapore does not see only libraries as the market place for its products and has restructured its programmes to meet the requirements of environments outside the traditional library.

1. Introduction and Background

In the last few decades, the world has moved from one in which trade, education and even technology, was largely defined and examined within the context of a country, to a world in which trade and commerce, technology, research and even higher education have become global. Nations are becoming increasingly inter-dependent. Today's world is one in which people and institutions exchange messages with their colleagues and counterparts across the globe, collaborate with them and coordinate activities using sophisticated technologies. Education programmes for Information Studies are, among other things, a function of global information ecosystem. Changes in the information landscape will undoubtedly impact functioning of all kinds of institutions in this *information*

society. Information has become an international commodity and is widely seen as a resource in addition to *Manpower, Material* and *Money*. The bulk of the information generated today is in digital form. An estimate puts the amount of new digital content created in 2011 at several million times that contained in all books ever written. The Organisation for Economic Cooperation and Development (OECD) figures show that Internet traffic has risen by 13,000 percent in the first decade of this century, with more digital information created between 2008 and 2011 than in all of previous recorded history.

In 2015 the International Federation of Library Associations and Institutions (IFLA) released a trend report that adopts a 'broader approach and identifies five top level trends shaping the information society, spanning access to education, privacy, civic engagement and transformation'. The report recognises that the information environment is constantly changing and examines 'how will we access, use and benefit from information in an increasingly hyper-connected world?'. The report identifies five top level trends that will play a major role in shaping the future information ecosystem. The trends identified in the report are:^[1]

- *New technologies will both expand and limit who has access to information:* The expanding digital universe will make information literacy skills and the ability to use digital technologies even more important for survival and effective functioning; people lacking these skills could face barriers and may face exclusion in a number of areas. The nature of new online business models will influence and determine who can successfully own, profit from, share or access information in the future. This may necessitate redefining the priorities of libraries; libraries may need to consider providing alternative means to search engines for information access and searching and also focus on digital literacy.
- *Online education will democratise and disrupt global learning:* The huge expansion in online education resources has made learning opportunities abundant, cheaper and more accessible. This coupled

with the rise of open access will affect the nature and services provided by libraries.

- *The boundaries of privacy and data protection will be redefined:* Huge data sets that are available to governments and companies have made tracking individuals easier, raising questions of individual privacy in the networked world. Libraries have begun examining the implications of e-lending as well as mobile technology in libraries on privacy and the protection of their users' data.
- *Hyper-connected societies will listen to and empower new voices and groups:* While on the one hand governments around the world have initiated programmes aimed at greater transparency and to provide access to data, there are also efforts by governments to keep an eye on online communication and censorship. What will be the role and approach of libraries vis-à-vis online censorship?
- *Global information environment will be transformed by new technologies:* New technologies enable libraries to federate with other information repositories such as digital archives, institutional repositories, etc.

The IFLA report also identifies the possible impact and implications of these developments on libraries and other information institutions.

2. The Scope of Information Studies

The understanding of what constitutes *Information Science* has remained reasonably stable since Harold Borko defined it in the late 1960s.[Borko, 1968; 3-5] Borko defined *Information Science* as the science 'that investigates the properties and behaviour of information, the forces governing the flow of information, and the means of processing information for optimum accessibility and usability. It is concerned with that body of knowledge relating to the origination, collection, organisation, storage, retrieval, interpretation, transmission, transformation, and utilisation of information. ... It has both a pure science component, which inquires into the subject without regard to its

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application, and an applied science component, which develops services and products'. In the 1990s, this was expanded by Marcia Bates to include what she called as the 'invisible substrate' of information science.[Bates, 1999; 1043-1050] We prefer to use the term 'information studies' to refer to the discipline as, in the recent past, *information science* has also been employed to denote a related sub-discipline of computer science and engineering. Information studies, like journalism and mass communication is a meta-discipline in that it is concerned with the subject matter of all disciplines. It is also an inter-disciplinary science in that it draws from several disciplines including library science, sociology, computer science, psychology, law, statistics, etc.

3. Global Trends in Education for Information Studies

There has been a general concern worldwide that education for the LIS profession is in some kind of a crisis. Many countries have set up committees to examine the implications of the rapidly transforming information landscape for higher education in general and education in information studies in particular. The USA had its KALIPER Report, and more recently the report of the symposium organised by the School of Information and Library Science of the University of North Carolina at Chapel Hill. Europe had the famous Sorbonne and Bologna Declarations agreeing on implementing the suggestions therein to harmonise the architecture of the European Higher Education System (twenty nine European countries participated and signed the declaration). Even though these were not specifically targeted at education in information studies, it was expected that European LIS schools would adopt the suggestions. Japan had the LIPER programme. India had two UGC curriculum development committees for LIS and, more recently, the National Knowledge Commission (NKC) which had set up a working group on libraries. The working group had the mandate to look into aspects of professional education also. As already mentioned, there are wide variations among the countries and it is not easy to identify trends that are global in nature. However, a few developments that have occurred in recent years appear to be strong movements and so indicative of emerging trends in education for information studies.

3.1 *i-schools*

A development that is clearly indicative of an important trend in education for information studies is the emergence of *i-schools*. In the United States, e.g., a large number of information professionals come out of *i-schools*. *I-schools* have evolved rapidly in Europe, Australia and even in East Asia. In many cases, these schools came into being after an assessment of the shortcomings of earlier LIS education programmes in meeting the manpower needs of a rapidly evolving information landscape. The *i-schools* designed programmes that were intended to specifically address the identified shortcomings. Some *i-schools* also came into being by merging existing departments (e.g., computer science and media studies, LIS and education). Globally *i-schools* are still evolving. As of today, there are 65 members of the i-school consortium spread across 21 countries. The i-schools organisation envisions a future in which the i-school movement has spread around the world, and the information field is widely recognised for creating innovative systems and designing information solutions that benefit individuals, organisations, and society.^[2] The i-school consortium seeks to maximise the visibility and influence of its member schools, and their interdisciplinary approaches to harnessing the power of information and technology, and maximising the potential of humans. The *i-schools* promote an interdisciplinary approach to understanding the opportunities and challenges of information management, with a commitment to universal access to information and user-centered organisation of information. In the coming decade, the programmes designed and offered by the *i-schools* will determine the way forward for education in information studies. An important characteristic of many *i-schools* is that their programmes are highly inter-disciplinary and the faculty is drawn from multiple disciplines.

3.2 *Widening the Information Environment*

Another global trend is the growing realisation by all that *information* is a crucial input for decision-making at all levels in all domains. There is a great diversity of types of information professionals and this diversity will increase in the coming years. There are clear indications that business schools and schools

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of computer science are designing and offering educational programmes that are aimed at training information professionals for certain segments of the information job market. Many *i-schools* and LIS schools are restructuring their own programmes to meet the requirements of a wider segment of the information job market not restricted to any institution of practice such as a library. Education for information studies, while realising that the timeless values of libraries will endure, are increasingly focusing on information work environments outside the library. For example, an area of focus is to design course contents and programmes to educate information professionals to work in an environment when the materials that used to be found only on library shelves are available on the internet, in digital repositories, in a wide variety of forms and formats. The boundaries between the information professions is blurring and education programmes in information studies have begun seriously considering the impact of the move from a document-centric to an information-centric future. Content providers will continue to bypass traditional media and create new channels for delivering, sharing, and accessing information. The convergence of rich digital content, mobile devices and social media have created an information environment in which people *do not have to go to find information*, but *information flows to them*.

3.3 Information Entrepreneur

The basic goal of any information system is to meet users' information needs. The users in turn will make use of the information in solving real world problems or in decision-making. Entrepreneurs are those who innovate and come out with solutions to real world problems. A growing trend in educational programmes for information studies is to inculcate entrepreneurial skills in students. Some LIS schools in developed countries are trying to develop such skills by seeking out entrepreneurial opportunities for their students by establishing relationships with appropriate agencies within and even outside the universities such as arranging internships in startup firms. The students develop entrepreneurial skills such as working as a member of a team in problem solving. Some schools have also introduced courses in entrepreneurship in collaboration with other academic units of the university, e.g. school of

management to equip students with the knowledge and skills required to start and run their own ventures.

3.4 *The Science of Information*

A major development, particularly since the emergence of *i-schools* is the emphasis in the educational programmes on developing the *science of information* as an academic discipline on par with the more established disciplines. In other words there is a trend to de-link the *science of information* from any particular kind of professional work or practice. The emphasis appears to be on understanding the *information* phenomenon, understanding the behaviour of *information*, *information users*, etc. The areas of research in *i-schools* are already attracting strong support from funding agencies and will have a profound impact on society and on the formulation of policy from local to international levels.

3.5 *Changes in Information Landscape*

There is growing realisation of the commercial value and importance of information. Access to all kinds of data — be it metadata (e.g., bibliographic data), full text or any other kind of data — has been difficult and comes at a cost. However, there is now a move to make data freely accessible. The open access movement is a step in this direction. The legal issues in providing access to information in the digital world are increasingly becoming more and more complex. Realising the importance for information professionals not only to be strong advocates of open access, but also to have a clear understanding of the legal, organisational, and commercial angles that comprise the information landscape, education programmes are introducing into their course contents, courses aimed at understanding the legal issues involved in accessing proprietary information.

3.6 *Changes in Higher Education*

Equally important for planning and developing strategies for education programmes in information studies is the identification of trends in higher education *per se*. Universities currently face economic pressures that will surely

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result in major structural changes. Technology is increasingly becoming central to the process of teaching and learning and in many countries technology has been effectively employed to widen access to higher education. Massive Open Online Courses (MOOCs) are an important development showcasing the use of technology in higher education; in recent years over 140 universities worldwide are providing free access to courses. This trend is still not so widespread in information studies; nevertheless this could become a major factor in the coming years. On the other hand, it has been suggested that over the next few decades higher education will move from mass education to customised individualised model of learning.

3.7 Accreditation

Accreditation is a quality assurance in which higher educational institutions and their programmes are evaluated by an external agency to check if applicable relevant standards are met. Accreditation of higher education institutions in information studies is prevalent in some countries. In North America, United Kingdom and Australia systems for accreditation of higher education programmes have been put in place resulting in a situation in which professional bodies (e.g., ALA, CILIP, etc) have a significant role to play. However, in Asia and some other regions of the world such an effective accreditation system is still not in place.

3.8 Course Contents

There is also a great deal of variation both in terms of actual course contents and emphasis among universities around the world. Makiko Miwa surveyed LIS education programmes in different regions of the world.[Miwa & Miyahara (eds), 2015; 3-24] The countries surveyed were grouped into four board regions: viz., North America, Asia, Oceania and Europe. The study found differences among countries in terms of content and emphasis. An attempt was also made to group the courses under a few broad headings. The following table gives an overview of the findings of this study.

Broad Category	Sample Courses
Basics of Library & Information Science	•Foundations of Information & Library Science· Research Methods
Information Resource Organisation	•Organisation of Information: Theory & Practicum
Information Users	•Information Behaviour· User Education
Information Media	•Information Media· Collection Development· Specialised Information Media
Information Services	•Information Services
Information Systems	•Information Retrieval· Database Design and Development
Management	•Foundations of Management· Knowledge Resources Management·Planning of Information Services
Digital Information	•Management of Digital Libraries

The study found that the differences between the traditional LIS education programmes and the newly started i-schools were particularly pronounced in the Asian region.^[3] It is difficult to see a trend cutting across the countries in so far as course contents are concerned. The nature of course contents appears to be a function of the state of development of libraries and the stage in which a country is in its transition to an *information society*. Many of the countries continue to emphasise library skills and focus the LIS curriculum on traditional library and information science courses, and add ICT aspects such as multimedia, information systems, knowledge organisation, information communication technology, digital libraries, information policy, web design, digital archiving, electronic publishing, and user information behaviour.

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3.9 Internationalisation

An important global trend in LIS education is that many countries are making serious efforts at internationalising their education programmes. The programmes in North American universities are already flexible enough to accommodate the needs and requirements of students from Asia and Africa. In U.K. the Loughborough University has designed some programmes keeping in mind the requirements of developing countries. However, increasingly universities in Australia, Japan and Singapore have initiated efforts to globalise their course curriculum so as to attract students from other countries. As an important component of such initiatives, there are efforts to design and implement credit courses acceptable and transferable to other universities.

4. Conclusions

There is no question that the information profession is at a cross roads. The environment in which information professionals operate has both widened and changed due to changes in technology. The diverse range of forms and the huge volumes of digital information that information professionals have to manage will make their traditional role as custodians of and as designers of systems to provide access to information resources more challenging. Scholarly communication has been transformed. End users information seeking behaviour has changed and their expectations are much higher as a result of extensive use of search engines and social media. The new technologies have altered the conventional methods of information storage and retrieval practised by librarians for more than a century. Those graduating from schools of information studies will enter this new world dominated by information technology and will be required to manage information that is global in scope and meet the requirements of organisations and individuals that are nodes in a global network. As many have pointed out, the changes that we are witnessing are not evolutionary in nature but are disruptive. It is only natural that such profound and fundamental changes in the information environment will require major changes in educational programmes for training information manpower. The future

information professionals will be expected to develop and apply sophisticated techniques and tools for preserving, accessing and managing information of all kinds. Designing programmes for educating information manpower for this digital environment will be the greatest challenge for all stakeholders including planners and policy makers and designers of educational programmes in *information studies*.

Notes

1. <http://trends.ifla.org/> (Accessed 15th March 2016).
2. <http://ischools.org/> (Accessed 15th March 2016).
3. The study did not cover India.

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Bio-data

Professor K. S. Raghavan is a Visiting Scientist, Centre for Knowledge Analytics and Ontological Engineering (KAnOE), PES University , Bengaluru 560085.