



A PROPOSED KNOWLEDGE MAP FOR LIBRARY, ARCHIVES AND INFORMATION SCIENCE FROM AN ACADEMIC-PROFESSIONAL VIEW HIGHLIGHTING CAIRO UNIVERSITY

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Abstract

The paper aims at introducing a new Knowledge Map for library, archives and information science that can help library schools to evaluate their coverage of Academic courses syllabi topics and professional skills as well as their future needs for specialized academic disciplines. The proposed Knowledge Map will be tested by applying it on the oldest library school in the Arab region, the department of library, archives and information technology at Cairo University on both the syllabi and Academic staff. The study reviews several efforts concerning categorizing or classifying library, Archives and Information science, like: The JITA Classification Schema of Library and Information Science and some search tools like Portal: Library and Information science...etc. The proposed Knowledge Map will be used as a measurable tool to answer the following two questions: what is the subject distribution of courses provided at the library school? What is the specialization map for the faculty staff working at the library school? Also, the proposed knowledge map could be used to explore the balance of search efforts and trends in the library school. The search efforts consist of both: Post graduate students' theses and dissertations subjects in addition to faculty staff published journal articles and conference papers.

Keywords:

Knowledge map – Cairo University, Dept. of library, Archives and IT – Specialization map – Subject distribution of courses – Knowledge sources classification – Information theories





(1) International Classification of Library, Archives and Information Technology, A literature review:

Information science is a young discipline. The earliest formal use of the term information science dates back to 1958 when the institute of information scientists (IIS) was informed in the UK. During two decades, 1958-1977, information scientists as well as researchers from other fields attempted to establish the core areas of research in information science and to define its boundaries to other disciplines. ¹ The situation is illustrated by figure (1)

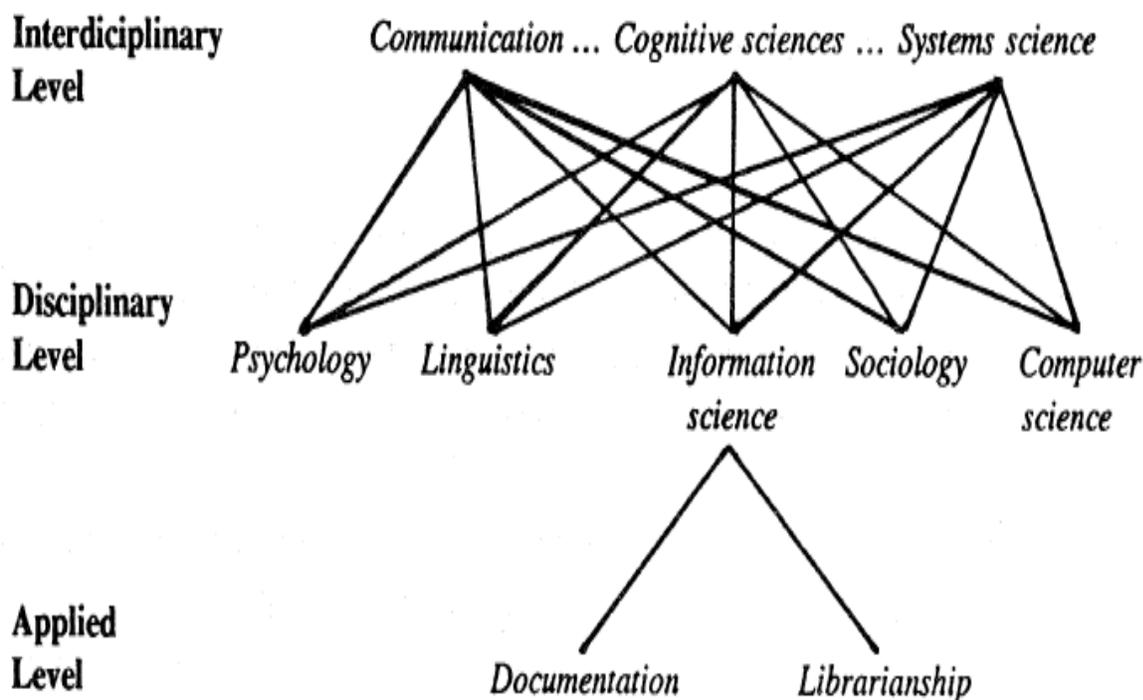


Figure (1) Information science viewed as one of several sciences of Information²

¹ Ingwersen, Peter (2001) Information retrieval Interaction. Accessed on 8th April 2012. Available at: http://comminfo.rutgers.edu/~muresan/614_IR/2004_Fall/Resources/OnlineBooks/Ingwersen_IRI/Ingwersen_IRI.pdf

² Ingwersen, Peter (2001) Information retrieval Interaction. P.3 Cited from Ingwersen, Peter (1991) Intermediary functions in Information Retrieval Interaction. Copenhagen, Business School. Faculty of Economics, Copenhagen: Samfundslitteratur. Doctoral dissertation. Accessed on 8th April 2012. Available at: http://comminfo.rutgers.edu/~muresan/614_IR/2004_Fall/Resources/OnlineBooks/Ingwersen_IRI/Ingwersen_IRI.pdf





From about 1960 the phrases "information science" and "information retrieval" were adopted, largely replacing the older term "documentation." This continuity was recognized by treating "documentation," when used in this context, as a synonym for IS. Information Science treated by the authors inclusively in two senses. First, they include specialized applications areas, such as archival, library, and corporate information services as specialties within a broad view of IS rather than specialties outside of it. Second, they agreed with VAKKARI that it is misguided on theoretical grounds (as well as difficult in practice) to separate the theory of library science and of documentation from that of IS.³

A distinguished scholar recognized five major channels or access lines concerned with knowledge and entertainment distribution simultaneously associated with library acquisition and the dissemination/ retrieval/use dimensions of transfer. They are: 1) traditional access to and provision of information only by means of representations of documents or information objects, i.e. library catalogues and bibliographic databases – the bibliographic access aspect; 2) existing physical access to non-electronic documents – by being in the library (or archive/museum) or by getting a copy delivered directly to the user; 3) the physical access to remote electronic documents or events via bibliographic access and unstructured (chaotic) distributed networks, i.e. like presently on the World Wide Web; 4) the feature-based intellectual access to structured and managed digital library collections; 5) the conceptual intellectual access, primarily made possible by a knowledge of the visitor demands and professional intervention and construction. This last

option is today perhaps only available in virtual museums.⁴

The JITA Classification Schema of Library and Information Science has been developed starting from a merger of NewsAgentTopic Classification Scheme (maintained by MikeKeen at Aberystwyth, UK, until 31st March 1998) and the RIS classification scheme of the (now defunct) Review of Information Science originally conceived by Donald Soergel (University of Maryland). JITA is an acronym of the authors' first names: Jose Manuel Barrueco Cruz, Imma Subirats Coll, Thomas Krichel and Antonella De Robbio. The following are the main three divisions and twelve sub-divisions:⁵

1-[Theoretical and General]: general level

- A. Theoretical and general aspects of libraries and information
- B. Information use and sociology of information

2-[User oriented, directional, and management functionalities]: intermediate level (socio-economical and legal issues included)

- C. Users, literacy and reading
- D. Libraries as physical collections
- E. Publishing and legal issues
- F. Management
- G. Industry, profession and education

3-[Objects, Pragmatics and Technicalities]: specific level

- H. Information sources, supports, channels
- I. Information treatment for information services
- J. Technical services in libraries, archives and museums
- K. Housing technologies

³ Buckland, Michael and Ziming Liu (1998) History of Information Science – A bibliography section of a literature review on pages 272-295 of Historical Studies in Information Science, by Trudi Bellardo Hahn and Michael Buckland - Published for the American Society for Information Science by Information Today, Inc., Medford, NJ, 1998. Accessed on 6th April 2012, Available at: <http://www.uff.br/ppgci/editais/historyofis.pdf>

⁴ Ingwersen, Peter (1999) The Role of Libraries and Librarians in Organising Digital Information - Libri, 1999, vol. 49, pp. 11–15, Accessed 1st May, Available at: <http://www.librijournal.org/pdf/1999-1pp11-15.pdf>

⁵ The JITA Classification Schema of Library and Information Science – e-prints in library and information science. Accessed 14th April 2012, Available at: <http://eprints.rclis.org/cms/jita/>





L. Information technology and library technology

Portal: Library and information science divides topics in library and information science to the following eight sections: General – Structure - Storage/ retrieval – Society – Institutions – Scientometrics – Informatics – Preservation. In each section there are several subdivisions, for example the Preservation section contains the following: Archival science, Conservation, Conservation movement, Preservationist, Art conservation and restoration, Digital preservation, Film preservation, Historic preservation, Case preservation.⁶ In Wikipedia the **Branches of library science** were as follows: Archival science - Bibliographic databases - Cataloging - Library instruction - Preservation - Readers' advisory – Reference.⁷

There is a Critical Delphi study conducted in 2003–2005 called “Knowledge Map of Information Science,” was aimed at exploring the foundations of information science. The international panel was composed of 57 leading scholars from 16 countries who represent nearly all the major subfields and important aspects of the field. They ended by a systematic and comprehensive knowledge map of the field. The map has 10 basic categories: (1) Foundations, (2) Resources, (3) Knowledge Workers, (4) Contents, (5) Applications, (6) Operations and Processes, (7) Technologies, (8) Environments, (9) Organizations, and (10) Users.^{8,9}

⁶ Portal: Library and information science, Wikipedia: the free encyclopedia. Accessed 3rd May 2012, Available at: http://en.wikipedia.org/wiki/Portal:Library_and_information_science

⁷ Outline of library science From Wikipedia, the free encyclopedia, Accessed 10th April 2012, Available at: http://en.wikipedia.org/wiki/Outline_of_library_science

⁸ Zins, chaim (2007) Classification Schemes of Information Science: Twenty-Eight Scholars Map the Field - JOURNAL OF THE AMERICAN SOCIETY FOR INFORMATION SCIENCE AND TECHNOLOGY, 58(5):645–672, Accessed 2nd May 2012, Available at: http://www.success.co.il/is/zins_28schemes.pdf

Also, the study documents 28 classification schemes of Information Science that were compiled by leading scholars in the academic community. This unique collection of 28 classification schemes portrays and documents the profile of contemporary Information Science at the beginning of the 21st century.¹⁰ The Library and Information Science education is on the threshold of facing new challenges of the new century. The great expectations however are in store to establish its durability and survival in the next millennium. Accordingly, the author proposed a modular approach for LIS with 6 core modules and 1 Elective module. The worked out modules are:

MODULE – 1: Foundations of Library and Information Science

MODULE – 2: Knowledge Organization, Information Processing and Retrieval.

MODULE – 3: Information Sources, Products and Services

MODULE – 4: Management of Library and Information Centers/Institutions

MODULE – 5: Information Technology: Basics and Applications

MODULE – 6: Research Methods and Statistical Techniques

⁹ Knowledge Map of Information science: Implications for the future of the field - JOURNAL OF THE AMERICAN SOCIETY FOR INFORMATION SCIENCE AND TECHNOLOGY, 58(4):526–535, Accessed 2nd May 2012, Available at: <http://www2.marilia.unesp.br/revistas/index.php/bjis/article/viewFile/32/51>

¹⁰ Chen, Chaomei (2007) Classification schemes of Information Science: Twenty-eight scholars map the field - Journal of the American Society for Information Science and Technology, Volume 58 Issue 5, March. Accessed on 4th May 2012, Available at: <http://dl.acm.org/citation.cfm?id=1231004>





MODULE – 7: Electives: Information Systems

Also, the author suggests that education and training programs in Library and Information Science must make a provision to prepare the professionals to assume the pro-active role in coping with the new technology and information explosion. In brief the designed course contents should concentrate in making the professionals as change agents, facilitators and guides with suitable and strong information empowerment.¹¹

It was recognized that there is a new concept for library schools in USA known as: The iSchool movement. It refers to the formation of information schools with the aim to embrace information, people, and technology in a cohesive educational and scholarly framework. As of January 2008, the iSchool community has 19 iSchools. Many of them have roots in library and information science schools. A common character of these iSchools is that they are interdisciplinary, including information science, computer science, and other disciplines.¹² Some of the commonly identified attributes of an iSchool include:

- 1) the focus of the school should be on information;
- 2) information should be clearly at the center of the schools' academic, research, and service programs;
- 3) the school should focus on the interaction of people with information and technology;

4) the faculty of an information school should come from various disciplines and have broad based, inclusive, multidisciplinary mindsets. A commonly used model of the iSchool movement is the notion of a scientific community as a framework that accommodates a variety of sub-fields.¹³

¹¹ Karisiddappa, C.R. (2003) Education and training for information empowerment specialists in the networked society: Indian experience - Paper to be presented at 24th Annual Conference IATUL 2003 on Libraries and Education in the Networked Information Environment, Middle East Technical University - Library, Ankara, Turkey, June 2-5, Accessed on 20th April 2012. Available at: http://www.iatul.org/doclibrary/public/Conf_Proceedings/2003/KARISIDDAPPA_fulltext.pdf

¹² Chen, Chaomei (2008) Thematic Maps of 19 iSchools- Accessed 12th May 2012, Available at: <http://cluster.ischool.drexel.edu/~cchen/papers/2008/asist2008-chen.pdf>

¹³ Ibid, p.1





A paper has explored qualitative methodologies appropriate to a research project investigating the boundaries and scope of the information profession, with specific reference to the skills/knowledge base and concepts of 'professionalism'.¹⁴

Table (1) Real iSchools in the USA, 2008

Institution	iSchool
Drexel University	College of Information Science and Technology
Florida State University	College of Information
Georgia Institute of Technology	College of Computing
Indiana University	School of Informatics
Indiana University	School of Library and Information Science
Pennsylvania State University	College of Information Sciences and Technology
Rutgers, the State University of New Jersey	School of Communication, Information, and Library Studies
Syracuse University	School of Information Studies
University of California, Berkeley	School of Information
University of California, Irvine	School of Information and Computer Sciences
University of California, Los Angeles	Graduate School of Education and Information Studies
University of Illinois	Graduate School of Library and Information Science
University of Maryland	College of Information Studies
University of Michigan	School of Information
University of North Carolina	School of Information and Library Science
University of Pittsburgh	School of Information Sciences
University of Texas, Austin	School of Information
University of Toronto	Faculty of Information Studies
University of Washington	Information School

¹⁴ Broady-Preston, Judith (2009) Qualitative methodologies for determining the skills and competencies required of the hybrid information professional of the 21st century - QQML2009: Qualitative and Quantitative Methods in Libraries, International Conference, Chania Crete Greece, 26-29 May. Accessed 12th 2012, Available at:http://www.isast.org/proceedingsQQML2009/PAPERS_PDF/Broady-Preston-qualitative_methodologies_for_determining_the_skills_and_competencies_PAPER-QQML2009.pdf





A paper concludes that the history of information science is an historical interdisciplinary and those interested in it need to draw on a range of related historical studies such as the history of science and technology, the history of printing and publishing, and the history of information institutions such as libraries, archives and museums.¹⁵

As information science continues to overlap with the academic disciplines of business and computing, the necessity of participating in collaborative efforts when designing curricula increases. At the same time, graduates from information science programs will need to acquire a common set of values and an understanding of the domain that defines the discipline and distinguishes it from others.¹⁶

The field continues to struggle with the problem of identity. Continuing tension between library science and other information related fields poses serious challenges for educators and practitioners. A focus needs to be maintained on addressing the information needs of individuals and groups that is the main concern of both fields. Programs need to define specializations clearly so as not to compete against each other for students and resources.¹⁷

(2) The Proposed Knowledge Map of Library, Archives and Information Technology – Philosophy and structure:

Library and information science education in Egypt is presently offered at different levels like Diploma, Bachelor's Degree, Master's Degree, PhD. The Bachelor's Degree is offered at Under Graduate level and Diploma, Master's Degree in Library and

Information Science and PhD are at Post-Graduate level at departments attached to the Universities.

A Knowledge Map is a tactic that can be used to teach organized knowledge. A Knowledge Map is a graphic illustration of interconnected information. There are two types of Knowledge Maps that are relevant for the comprehension of organized knowledge: Hierarchy Maps and Spider Maps. A Hierarchy Map shows the overall hierarchical breakdown of organized knowledge into subordinate or lower levels. A Spider Map shows the relationships between interconnected information.¹⁸

The Proposed Knowledge Map for Library and Archives and Information science and Profession

First: Main six sectors/ divisions

1. **Theories**, Foundations, concepts, and intellectual assets, introductory materials...
2. **Historical** background, Developmental phases and technological eras.
3. **Production**, Writing, Publishing, Printing, copying, preservation, conservation, dissemination, digitization and Curation
4. **Acquiring**, holding, collecting, purchasing, subscribing, exchange and gifts
5. **Organizing**, cataloguing, classification, subject analysis, Authority control, Indexing, Abstracting and metadata
6. **Information** services, Information sources, circulation, reference and Q&A

Second: Main three facilitators/ keepers

- A- **People**: authors, translators, interpreters, illustrators and Users...
- B- **Institutions**: libraries, information centers, archives...
- C- **Systems**: databases, knowledge-bases, information systems, integrated library systems, e-Archiving systems...

Third: Seven Facets/ sub-divisions or sub-sectors

¹⁵ RAYWARD, W. BOYD (1996) The history and historiography of informationscience: some reflections - Information Processing & Management, Vol. 32, No. 1, pp. 3-17. Accessed 2nd May 2012, Available at: <http://www.sciencedirect.com/science/article/pii/030645739500046>

¹⁶ Mezick, Elizabeth M. and Michael E. D. Koenig (2008) Education for Information Science – chapter 13 -Pp. 593-624 In, Cronin, Blaise (ed.). Annual review of information science and technology (ARIST). Vol. 42, 2008. Medford, NJ: Information Today, Inc., [2007]. xxvi, 686 p.

¹⁷ Ibid, p.615

¹⁸ How do I use knowledge maps? Charting a course...Accessed on 5th April 2012, Available at: <http://www.lpg.fsu.edu/charting/InstructionalStrategies/howto-tactics/ht-k3okkmap.asp>





1. **Methodology:** research methods and tools, scientific, critical and systems thinking, systems analysis and design, Statistics, Metrics...
2. **Management:** Legislations and law, Economics, Commerce, Politics, Standards and rules...
3. **Technology:** Programming, Networks, software, Web-sites design and development, Mobiles, scanners...
4. **Publicity:** Mass communication, scholar communication, marketing...
5. **Education and Sciences:** teaching and learning, psychology, social science, history, geography...
6. **Language:** Arabic language and literature, foreign languages, translation...
7. **Soft/ life skills- oral and written communication skills:** writing reports, organizing meetings, exhibitions, negotiations, self-confidence...

(3) The Proposed Classification of Library, Archives and Information Technology- Application on Syllabi and Staff:

The proposed Knowledge Map is used in this section as an assessment tool to reveal the subject

Table (2) Subject distribution of courses at Cairo University, school for library, Archives and Information science

Sections	Cairo University – Library school – subject distribution (working now) 90 courses	Cairo University – Library school – subject distribution (future change) 44 courses
First: Main six sectors/ divisions		
1. Theories , concepts, and intellectual assets, introductory materials...	Gen.= 3 Lib.= Ach.= 2 Inf.=	3
2. Historical background, Developmental phases and technological eras.	Gen.=2 Lib.= Ach.= 1 Inf.=	2

distribution of courses provided at the library school as well as the specialization of the academic staff working at the library school? Also, it is recommended to apply the proposed knowledge map to explore the balance of search efforts and trends in the library school. The search efforts of any library school can be recognized in two main streams which are: (1) Post graduate students’ theses and dissertations subjects in addition to (2) academic staff published journal articles and conference papers.

3- 1 Assessment of subject distribution of courses at Cairo University, school for library, Archives and Information science:

Table (2) shows the distribution of courses at Cairo University, Library School which is being taught by the old and present study regulation as well as the courses that will be taught in the future study regulation. It is clear that the reduction in the number of courses from 90 to 44 due to the integration of the sub-divisions: Librarianship + Archives and historical documents + Information Technology into one educational track.





3. Production , Writing, Publishing, Printing, copying, preservation, conservation, dissemination, digitization and Curation	Gen.= Lib.= 1 Ach.= 1 Inf.= 1	3
4. Acquiring , holding, collecting, purchasing, subscribing, exchange and gifts	Gen.= 1 Lib.= Ach.= Inf.=	1
5. Organizing , cataloguing, classification, subject analysis, Authority control, Indexing, Abstracting and metadata	Gen.= 2 Lib.= 3 Ach.= 4 Inf.= 1	7
6. Information services, Information sources, circulation, reference and Q&A	Gen.= 3 Lib.= 4 Ach.= 2 Inf.= 3	9
Total	34	25
Second: Main three facilitators/ keepers		
A- People : authors, translators, interpreters, illustrators and Users...	Gen.= Lib.= Ach.= Inf.=	1
B- Institutions : libraries, information centers, archives...	Gen.= Lib.= 2 Ach.= 1 Inf.= 1	2
C- Systems : databases, knowledge-bases, information systems, integrated library systems, e-Archiving systems...	Gen.= Lib.= 2 Ach.= 2 Inf.= 4	4
Total	12	7
Third: Six Facets/ sub-divisions or sub-sectors		
1. Methodology : research methods and tools, scientific, critical and systems thinking, systems analysis and design, Statistics, Metrics...	Gen.= 3 Lib.= Ach.= 1 Inf.= 1	2
2. Management : Legislations and law, Economics, Commerce, Politics, Standards and rules...	Gen.= 1 Lib.= 2 Ach.= 1 Inf.= 3	3
3. Technology : Programming, Networks, software, Web-sites design and development, Mobiles, scanners...	Gen.= 2 Lib.= 2 Ach.=	2





	Inf.= 4	
4. Publicity: Mass communication, scholar communication, marketing...	Gen.= Lib.= 2 Ach.= 1 Inf.=	1
5. Education and Sciences: teaching and learning, psychology, social science, history, geography...	Gen.= 2 Lib.= Ach.= 3 Inf.=	
6. Language: Arabic language and literature, foreign languages, translation...	Gen.= 5 Lib.= 4 Ach.= 3 Inf.= 4	4
Total	44	12
Total for the three sections	90	44

Table description for Undergraduate courses:

Gen.= General = courses provided during the first and second year where there is no specialization. The specialization starts from the third year and ends by the fourth year.

Lib.= Library Section = courses provided during the third and fourth year which depend on the students' choice.

Ach.= Documents and Archives Section = courses provided during the third and fourth year which depend on the students' choice.

Inf.= Information Technology Section = courses provided during the third and fourth year which depend on the students' choice.

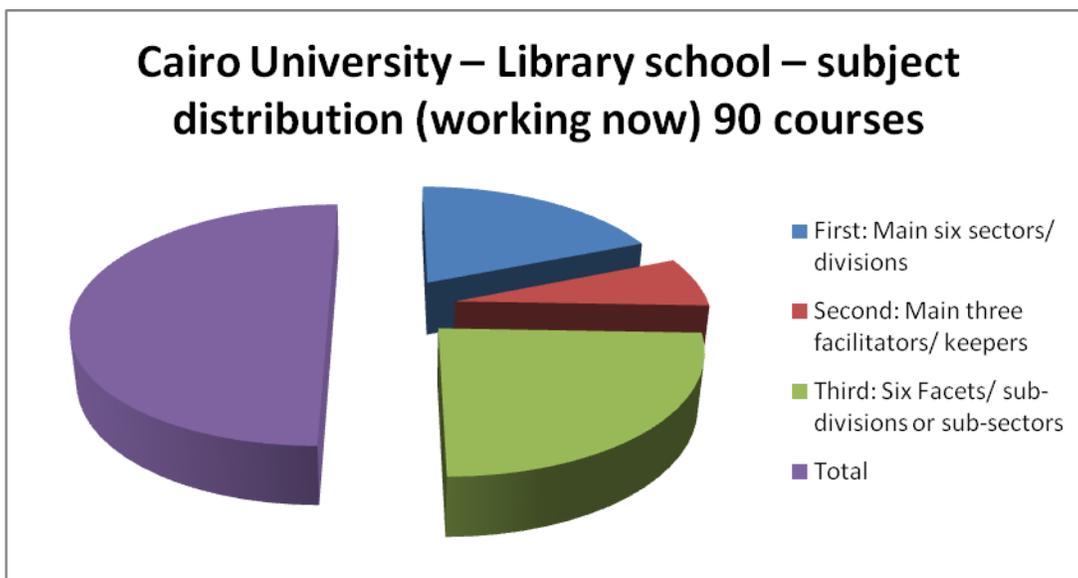


Figure (2) Cairo University – Library school, old and present study regulation





Cairo University – Library school – subject distribution (future change) 44 courses

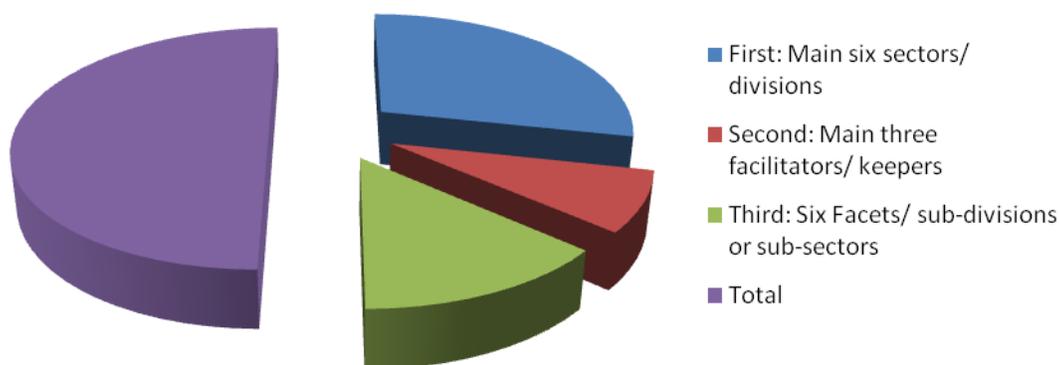


Figure (3) Cairo University – Library school, future study regulation

We may realize that Medicine, Engineering, Industry, Chemistry, Physics, Biology, Nursing and Mathematics are missing sciences from the third section (Six Facets/ sub-divisions or sub-sectors)

3- 2 Assessment of specialization of the academic staff (PhD holders only) at Cairo University, school for library, Archives and Information science

Cairo University, department of library, archives and information technology comprises 83 individuals classified as follows: 18 demonstrators, 8 assistant lecturers, 22 Assistant professors (Lecturer), 19 Associate professors, 16 professors. **Our analysis** concerns only with three categories: Professors + Associate Professors+ Assistant Professors (Lecturer) excluding those on leaves or long vacations. **The total no. equal= 43 faculty staff.** Table (3) shows the distribution of the specialization of the staff according to the year of granting the PhD degree. It is worth mentioning that Cairo university department is the oldest among other departments all over the Arab world.





Table (3) Specialization of faculty staff at Cairo University, school for library, Archives and Information science

Sections	Cairo University – Library school – academic staff specialization (PhD holders only)					
	60's	70's	80's	90's	2000-2009	2010 -
First: Main six sectors/ divisions						
1. Theories, concepts, and intellectual assets, introductory materials, literature...			1	1		
2. Historical background, Developmental phases and technological eras.						
3. Production, Writing, Publishing, Printing, copying, preservation, conservation, dissemination, digitization and Curation				1		
4. Acquiring, holding, collecting, purchasing, subscribing, exchange and gifts		1		1		
5. Organizing, cataloguing, classification, subject analysis, Authority control, Indexing, Abstracting, Bibliographic control, Documents management and metadata	1	2		1	4	1





6. Information services, Information sources, Manuscripts, Historical documents, circulation, reference and Q&A	2			9	1	3
Total – Section (1)	3	3	1	13	5	4
Second: Main three facilitators/ keepers						
A- People: authors, translators, interpreters, illustrators and Users...				1	1	
B- Institutions: libraries, information centers, archives...		1		2		1
C- Systems: databases, knowledge-bases, information retrieval systems, integrated library systems, e-Archiving systems and portals...				1	1	2
Total – Section (2)	0	1	0	4	2	3
Third: Six Facets/ sub-divisions or sub-sectors						
1. Methodology: research methods and tools, scientific, critical and systems thinking, systems analysis and design, Statistics, bibliometrics, Metrics...				3		
2. Management: Legislations and						1





law, Economics, Commerce, Politics, Standards and rules, Information and Knowledge societies...						
3. Technology: Programming, Networks, software, Web-sites design and development, Mobiles, scanners...						
4. Publicity: Mass communication, scholar communication, marketing...						
5. Education and Sciences: teaching and learning, psychology, social science, history, geography...						
6. Language: Arabic language and literature, foreign languages, translation...						
Total – Section(3)				3		1
Total for three Sections	3	4	1	20	7	8

Figures (4) (5) (6) show the distribution of Main six sectors/ divisions: Theories, Historical background, Production, Acquiring, Organizing, Information services and sources. It is clear that the 90's was the most active scientific decade. It is clear that "**Information services and sources**" come first in order with the biggest number of PhD (15 dissertations) and "Information organizing" comes at the second order by 9 dissertations. Also, it is worth mentioning that research areas like: "**Historical background**, Developmental phases and technological eras", "**Management**: Legislations and law, Economics, Commerce, Politics, Standards and rules, Information and Knowledge societies...", "**Technology**: Programming, Networks, software, Web-sites design and development, Mobiles, scanners...", "**Publicity**: Mass communication, scholar communication, marketing...", and "**Production**,



Writing, Publishing, Printing, copying, preservation, conservation, dissemination, digitization and Curation” are almost neglected!

Also, it is clear that “**People:** authors, translators, interpreters, illustrators and Users...” are not interesting topics for PhD researches at Cairo University, however, studying both users and library staff are essential or vital for the success of any service or system.

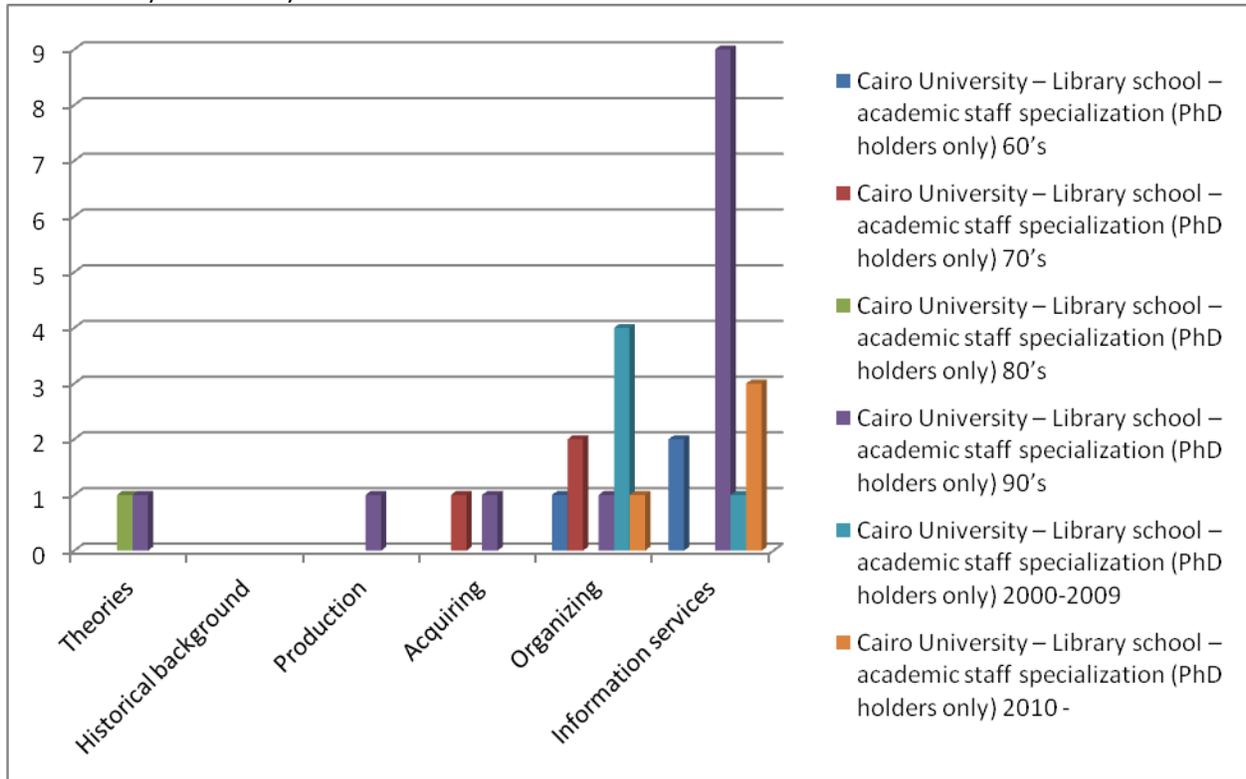


Figure (4) Main six sectors/ divisions distribution

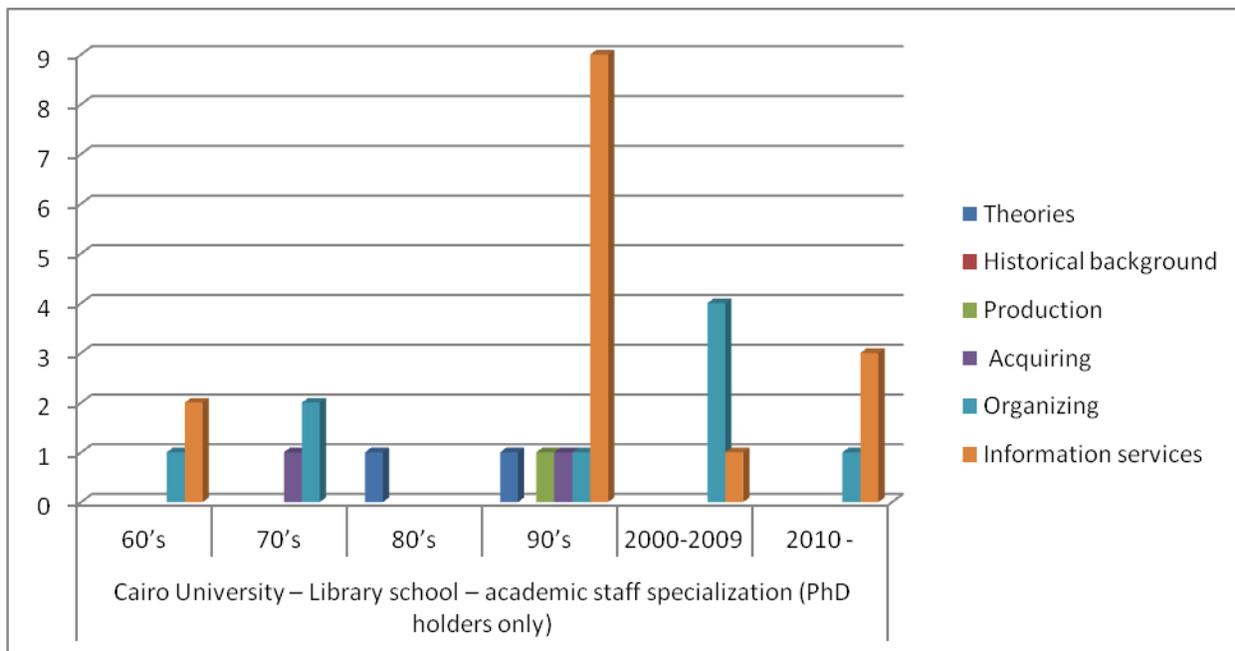


Figure (5) Main six sectors/ divisions chronological distribution

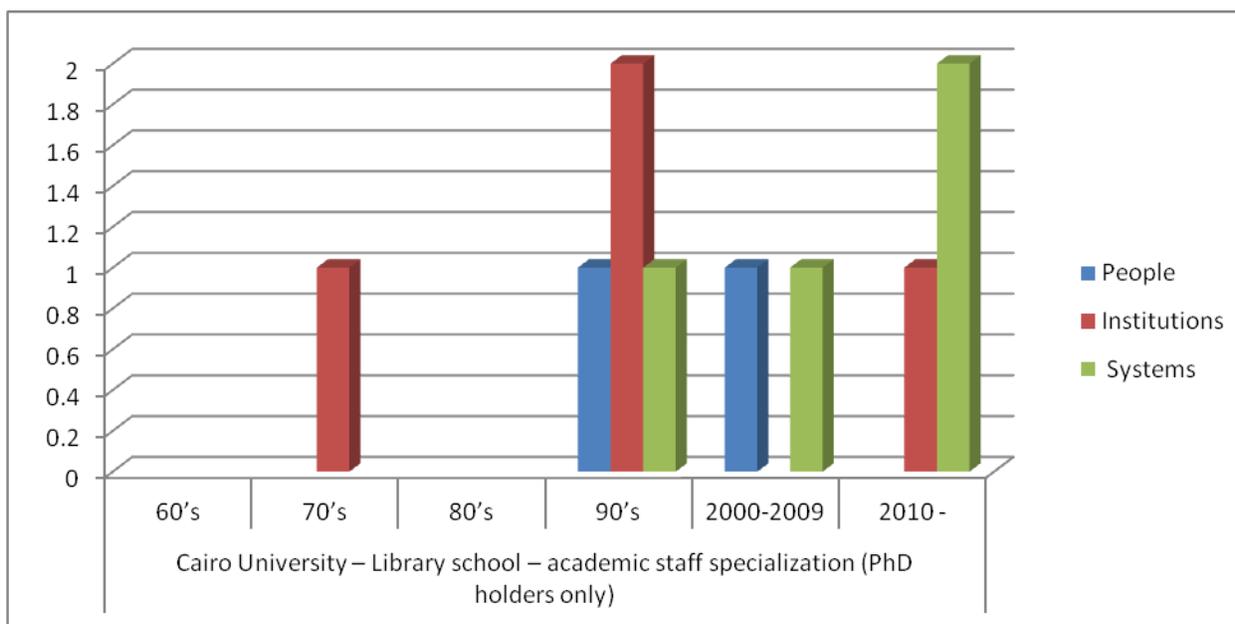


Figure (6) Main three facilitators/ keepers chronological distribution



(4) Conclusions and Recommendations:

1. Cairo University, department of library, archives and information technology faculty staff believes in Ranganathan's vision for the core specialization of library science known as the external memory. Due to this established believes it is very rare to think or give interest to internal memory or tacit knowledge.
2. Joined research is not advised by pioneers of library science at Cairo University, department of library, archives and information technology.
3. International publishing is not recommended by pioneers of library science at Cairo University, department of library, archives and information technology.
4. Cairo University, department of library, archives and information technology needs to **open channels for cooperation with similar international schools as well as international professional associations** like: ARMA International (Association of Records Managers and Administrators)¹⁹, The Institute of Certified Records Managers (ICRM)²⁰,
5. Cairo University, department of library, archives and information technology needs to give **attention to Soft/ life skills**: writing reports, organizing meetings, exhibitions, negotiations, self-confidence...
6. An increasing variety of **on-line educational resources** are available to archivists and records managers now that distance learning has expanded from correspondence courses, television and videotape to include interactive
7. courses delivered over the Internet. Some colleges and universities now offer whole degree programs from Associate degree to a PhD on-line.
8. Many people think that the librarian is a book keeper and its aim is to preserve the books in a place called library or at most to lend the materials when asked for.²¹

¹⁹ Is a not-for-profit professional association and the authority on managing records and information – paper and electronic. ARMA offers invaluable resources. The association was established in 1955. Its approximately 11,000 members include records managers, archivists, corporate librarians, imaging specialists, legal professionals, IT managers, consultants, and educators, all of whom work in a wide variety of industries, including government, legal, healthcare, financial services, and petroleum in the United States, Canada, and 30-plus other countries. ARMA International publishes Information Management (IM) magazine, the only professional journal specifically for professionals who manage records and information on a daily basis. The association also develops and publishes standards and guidelines related to records management. It was a key contributor to the international records management standard, ISO-15489. Accessed on 1st May 2012, Available at: <http://www.arma.org/about/overview/index.cfm>

²⁰ Is an international certifying organization of and for professional records and information managers. The ICRM was incorporated in 1975 to meet the requirement to have a standard by which persons involved in records

and information management could be measured, accredited and recognized according to criteria of experience and capability established by their peers. The primary mission of the ICRM is to develop and administer the professional certification of Records and Information Managers including the relevant examinations and certification maintenance program. The ICRM serves as the official certifying body for both ARMA international and the Nuclear Information and Records Management Association (NIRMA). Accessed on 1st May 2012, Available at: <http://www.icrm.org/about/>

²¹ Fadaie, Gholamreza (2008) In Search of New Identity for LIS Discipline, with Some References to Iran - Issues in Informing Science and Information Technology Volume 5. Accessed 11th April 2012. Available at: <http://psyedu.ut.ac.ir/acstaff/Fadaei/articale/IISITv5p499-511Fadaie409.pdf>



9. The author recommends a **new classification for information and knowledge sources** in the light of the severe changes and technological developments in the area of publishing industry, media production and Virtual life (Second life)²². Also, the proposed classification concerns and give the right respect and appreciation to the two main Unique or distinguished information sources that are not equal to mankind external memory expressed in different information sources. In addition the new classification takes into account the two types of knowledge: explicit and tacit knowledge.

10. While ‘**convergence**’ has been a topic of much discussion in the museum, archive and library communities, the emerging similarities between these **three types of cultural heritage institutions** – most apparent in their on-line activities – are not yet evident in the education of professionals who work in them. Curriculum models still support traditional definitions of the roles, functions and audiences of archives, libraries and museums. Professional practice can evolve in the context provided by digital heritage and digital Curation, and to respond in a manner that supports common goals across institution types.²³

First level	Second level Physical life	Third level Electronic/ virtual life
holy books	people	people
Nature	Institutions	Institutions
	Devices	Devices
	Products	Products
	Laws and legislation	Laws and legislation
	Sources of documentary information	Sources of documentary information
	1. Primary	1. Primary
	2. Secondary	2. Secondary
	3. Tertiary	3. Tertiary
	Others	Others

Figure (7) a proposed classification for Information and Knowledge sources

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