Development of Arabic Library and Information Science: an Analysis Utilizing Whitley's Theory of the Intellectual and Social Organization of Sciences

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Abstract

Purpose – The paper utilizes Whitley's (1984; 2000) theory of the intellectual and social organization of the sciences and builds on research carried on by (Aarek et. al, 1992; Vakkari, 1996; Rochester and Vakkari, 2004 and Åström, 2008), to analyze both intellectual and institutional characteristics of Arabic library and information science.

Design/methodology/approach – Data derived from a content analysis of sampled research articles published in seven core peer-reviewed Arabic LIS journals and from an inventory of the currently identified Arabic LIS educational institutions, professional associations, and scholarly communication channels were analyzed in terms of Whitley's theory and relevant LIS research.

Findings – The social organization of Arabic LIS has highly influenced its intellectual organization. An analysis of types and diversity of institutional affiliations, determination of terminology, resources and fund accessibility, scholarly communication of intellectual productivity, and research collaboration point to high levels of 'tasks uncertainty', low levels of 'mutual dependency' and uncontrolled 'reputational autonomy'.

Research limitations/implication – Because Arabic LIS institutions, associations, and research channels are poorly represented on the Internet or in accessible literature, it was difficult to collect data comprehensively. While our findings are suggestive and are in agreement with views from the Arabic LIS literature, our results cannot be generalized to regions beyond the Arab World. This investigation is not primarily intended as a contribution to the philosophy of LIS, but to describe the development of LIS in the Arab States within a broad social and intellectual framework.

Originality/value – While there is a considerable body of theoretically oriented interpretations for bibliometric findings, no research has been conducted to analyze the social and intellectual dimensions of LIS in the Arab World. This paper also fills a gap for this type of the research in Arabic LIS and creates awareness of Arabic LIS for English-speaking readers.

Keywords – LIS research, The Arab World, Intellectual and social organization of sciences.
Paper type – Research paper

Introduction

Library and information science (LIS) in the Arabic-speaking world (referred to in this article as the Arab World) has a long and distinguished history, but is not widely known, nor are LIS contributions by Arabic-language scholars much cited, outside this language area. A number of critics have suggested that Arabic LIS (LIS in the Arab World) has fallen behind in comparison with LIS in western countries (Abdul-Hadi, 2001; Gdoura, 2008). In response, the purpose of this article is to investigate empirically the state of LIS education and research in the Arab World. Research on LIS as a field of

scientific study and research, also referred to as meta-theoretical research (Järvelin and Vakkari 1990, Rochester, and Vakkari, 2004), is by no means unique, in fact, it is quite popular. In particular, LIS researchers have used bibliometric and scientometric techniques (themselves a contribution from the field of LIS), to study the field itself.

Bibliometric studies of LIS research have been undertaken in many countries and regions, and some studies have compared LIS research in various countries, with the emphasis on research productivity and the evolution of research in terms of themes and methods. Various explanatory theories have been developed to account for the findings of these studies, often utilizing conceptual frameworks derived from the philosophy, history and sociology of science, for example Kuhn's (1962; 1970) theory of "Paradigm Shift" (e.g. Brooks, 1989; Dick, 1995; Bates, 1999; Glazier, 2002; Hillenbrand, 2005; and Robinson & Karamuftuglu, 2010), Merton's (1973) sociology of science for interpreting the sociology of citation (e.g. Baldi, 1998; Cronin, 2004; and Cronin, 2008), Social Epistemology (e.g. Fallis, 2002; Floridi, 2002; Budd, 1995; and Hjørland, 2005); and Price's (1963) Little vs. Big Science (e.g. Furner, 2003; Kiadó, 2004; Wani & Gul, 2008; and Andersen & Hammarfelt, 2011). Here we should also mention Critical Theory (e.g. Dick, 1993; Benoit, 2007; and Leckie, Gloria, Given, and Buschman, 2010). The literature also includes several descriptive studies that investigate the development of institutional education in different countries and regions. Some recent examples of such studies are: Singh (2003), Virkus and Wood (2004), Audunson (2005), Ocholla and Bothma (2007), Robinson and Bawden (2010). Taking a somewhat broader approach, a group of largely Nordic writers, for example Aarek et al. (1992), Vakkari (1996), Rochester and Vakkari (2004), Åström (2008), and Nolin and Åström (2010) have utilized the theory of Whitley (1984; 2000) for the observation and explanation of intellectual and social development of LIS.

This article is intended to contribute to international reflection on, and analysis of, Arabic LIS research, about which little has been published in English-language international journals. Therefore, this research could help fill a gap for the English readership about the state of institutionalization of the Arabic research in LIS. In addition, this article seeks to contribute to a broader understanding of LIS as an international scientific field by following in the footsteps of the above-mentioned Nordic researchers in applying the theory of Whitley to our analysis of the intellectual and institutional characteristics of LIS in the Arab World.

We chose Whitley's theory of the intellectual and social organization of the sciences primarily because we wished to continue the line of analysis developed by Aarek, Åström, Järvelin, Vakkari and other researchers. Furthermore, unlike other relevant theories like paradigm shifts, normative sciences and the views mentioned earlier, Whitley offers an encompassing approach to explain both the intellectual and

the social organization of science. Moreover, Whitley's theory is relevant to the current research because it allows profound investigation and interpretation of the intellectual and social development of scientific communities (Fry and Talja, 2007; Talja, Vakkari, Fry, and Wouters, 2007; Krampen, Fell, and Schui, 2011). Weingart (2003), cited and translated in Krampen, Fell, and Schui (2011), asserted that Whitley's theory is "the largest and most cogent attempt to integrate the different observations of disciplines' development and the social organization of science in a single theoretical framework" (p.2). However, our use of Whitley's theory in this paper is not intended for the purpose of its refinement or verification. It was chosen for its utility in suggesting avenues of interpretation of the development of a discipline in a geographical area including Egypt, North African and Mediterranean Arab countries, and Gulf Cooperation Council (GCC) countries, which differ significantly in terms of cultural and socio-economic backgrounds, within a framework which would permit useful comparisons with conditions of LIS education and research in other countries and regions. Thus our purpose is not to discuss the nature or status of Library and/or Information Science as a science, but to analyse the state of LIS in our chosen region.

Literature Review

The Arab World consists of the 22 countries which formed the League of the Arab States in Egypt in 1945. These countries had a total population of 340 million in 2007. Egypt was recorded as the most populous country with a population exceeding 77 million (League of Arab States , 2010). The Arab countries share common characteristics of language, religion, and cultural heritage. They differ, however, in terms of their political affiliations and the current state of their socio-economic development.

Although the Arab World enjoyed a period of intellectual ascendancy some eight to eleven centuries ago, attracting many of the best scholars of the time, today the Arab countries face challenges in teaching basic sciences at the university level (Castillo, 2004). Modern or western-style institutions of higher education, including universities, are still a comparatively recent development in the Arab World, particularly when compared to the long traditions of higher education found in most developed western countries. In 1950, the 22 countries of the Arab World had no more than 10 universities (UNESCO, 2003). Although the number of universities in the Arab World increased to more than 200 by 2003, these institutions still need to make a greater contribution to human, scientific, and social development (UNESCO, 2003). UNESCO reported in 2003 that part of the reason for the failure of Arab universities was found in their curricula, which in general have failed to meet the demands of the rapidly transforming societies they serve. Moreover, many of educational programs and specializations offered in these universities are traditional in nature and limited in objectives and scope, with

humanities disciplines often given greater emphasis than science disciplines (UNESCO, 2003).

The recent World University rankings serve as an indicator of the generally disappointing state of Arab universities. None of the over 200 universities in the Arab World, was recognized as being amongst the best 200 worldwide universities (The Times Higher Education Supplement, 2009). A number of factors may account for this poor result, the most important and widespread of which is lack of sufficient funding (United Nations Development Programme, 2003; Hassan, 2006). Lack of resources does not necessarily account, however, for the difficulties faced by universities in the wealthier countries in the region, like most of those in the countries of the Gulf Cooperation Council (GCC). In these cases the principal problems relate to the relatively new and under-developed nature of the universities, which lack sufficient intellectual capital in an increasingly competitive global education marketplace (Castillo, 2004). Building internationally recognized and consistently performing universities has proven difficult when there is a very small number of suitably qualified local academics to meet the staffing requirements, and many of the staff are brought in from overseas on short term contracts. Conversely many of the highest achieving and most ambitious Arab graduates are attracted to working in the prestigious research universities in Western Europe and North America (Altbach P. G., Reisberg L. and Rumbley L. E., 2009, p.92; and Castillo, 2004), thereby compounding the problems associated with the quality of teaching and research staff.

Other problems are associated with the often traditional nature of Arab societies, wherein the "prevailing cultural and political practices" (Hassan, 2006, p. 38) often inhibit the development of the universities in the region. In a number of the Arab countries the often underdeveloped civil society, which in many cases is slow to value educational and academic achievement, militates against the express wishes of governments to achieve excellence in higher education (Hassan, 2006). Reactionary bureaucratic and political influences have been recognized as constraints which inhibit the growth of a healthy higher education sector in the Arab World (Castillo, 2004).

Funding and financial support for LIS research plays an important role in the social and intellectual organization of the discipline overall. Nevertheless, investment in LIS research varies worldwide. The relative prosperity of LIS in North America and West European countries contrasts with its poverty and paucity in most of the rest of the world, as can be observed in the dominant position of international journals published in English. "The dominant language of the global information infrastructure in LIS is English" (Davarpanah & Aslekia, 2008, p.34). Arabic LIS research, like that in most of the humanities and social sciences fields in the region, lacks a systematic and organizational financial support base (Abdul-Hadi, 2001; Aljawhari, 2009). Although no data were

available to track expenditure on Arabic LIS research, only a few organizations which have very limited funds, namely the Arab League Educational, Cultural and Scientific Organization, the Egyptian National Research Center, and King Fahad National Library (Abdul-Hadi, 2001), are known to help support research in LIS. Only academics and researchers who are affiliated with universities can receive a modest part of the financial support that is allocated for all teaching departments within the institutional structure. This suggests that the field lacks recognition from both public and private sectors in the Arab World.

Literature reporting Library and Information Science research can mainly be viewed from two different angles. One mainly concentrates on investigating current trends in Library and Information Science research, covering the potential research areas and the methods used to study them. Investigation is sometimes extended to assess further variables such as collaborative authorship, affiliation of authors, and gender of authors. Such research typically uses content analysis of research publications in particular geographical areas or selected LIS publication outlets. The literature reveals a large and still growing body of such research. Examples of some recent literature of this type are Blessinger and Hrycaj (2010), Gore et al. (2009), Nasser and Mahmood (2009), Patra and Chand (2009), and from the Arab World, Al-Amoodi and Jawhari (2009). However, the majority of these studies are repetitive in terms of research strategies and methods used to collect and interpret data.

This study, however, belongs to a second, much less prevalent, type of research, which investigates LIS from the intellectual and social organization of sciences, as developed by Whitley (1984; 2000). Only a few examples of such investigations utilizing Whitley's theory as a basis of interpretation have so far appeared, namely work by Aarek et al. (1992); Rochester and Vakkari (2004); Vakkari (1996); and Åström (2008).

Aarek et al. (1992) studied LIS research of the Nordic countries. They used the categorization scheme devised by Järvelin and Vakkari (1993) for defining the characteristics of research and conceptualized their study utilizing Whitley's theory of intellectual and social organization of the sciences. They found both similarities and diversity across the Nordic countries, but concluded that the overall social organization had an impact on the development of research problems, research strategies, and theoretical approaches.

Rochester and Vakkari (2004) used published results of bibliometric studies in Scandinavia, Australia, China, Spain, Turkey, and United Kingdom to describe and compare national differences of cognitive and social organization of LIS research. Their comparison showed remarkable variations in trends of research in the countries investigated, which they attributed to cultural differences among those countries. The

research concluded that in certain countries a well developed social organization of LIS has positively influenced and affected the intellectual organization of the LIS discipline.

Åström (2008) described and analyzed the social organization of LIS in the Nordic countries using Whitley's theory as a conceptual framework. He found diverse forms of institutionalization and of affiliation to the academic structures across the Nordic countries. The result also indicated a strong presence of the Nordic LIS research in the international arena.

On the basis of Whitley's categorization of scientific fields, Nolin and Åström (2010) described and conceptualized the characteristics of LIS as a fragmented adhocracy. They identified a set of ten interrelated characteristics for LIS as a field in crisis. These characteristics included vague boundaries and fragmentation within LIS. Such a characterization of LIS as 'science in crisis' or as an 'immature' field was earlier articulated by several authors such as Houser & Schrader (1978); Brooks (1989); and recently by Glazier (2002); Floridi (2002); and Hillenbrand (2005).

Conceptual framework for the study

In a book first published in 1984 with a second edition in 2000, Richard Whitley, a professor of organizational sociology at the University of Manchester Business School, developed a conceptual framework for the study and comparison of scientific fields. In this section page references are to the second edition (Whitley, 2000). Whitley looked at "...modern sciences as particular kinds of work organizations which construct knowledges in different ways in different contexts" (p.6). His work deals with "intellectual fields", more frequently referred to as scientific fields, rather than disciplines, covering not only the natural sciences but all forms of modern scholarship, as "reputational systems of work organization and control" for the production and evaluation of knowledge (p.7). What is distinctive about such systems is that researchers have to produce new knowledge ("novelty and innovations", p.11), which inherently entails uncertainty about task outcomes as well as frequent innovations in techniques and procedures. At the same time they depend on their colleagues for the establishment of their reputations. Their innovations are valued to the extent that they are useful to the work of other scientists, which implies adherence to common research strategies and procedures (pp.11-13). Thus:

> As systems of work organization and control, the modern sciences are distinguished [...] by their commitment to producing novelty and innovations, on the one hand, and their coordination of research procedures and strategies through collective appropriation and use of their results, on the other hand. (p.13)

Whitley introduced the terms "task uncertainty" (p.14) and "mutual dependence" (p.85) to refer to these dimensions of scientific fields respectively and claimed that differences between the sciences can be explained in terms of these

> ...two distinct dimensions: the degree of mutual dependence between researchers in making competent and significant contributions and the degree of task uncertainty in producing and evaluating knowledge claims (p.85, Whitley's emphases).

Whitley elaborated on this explanatory framework by making further distinctions within each dimension. He distinguished two aspects of mutual dependence: *functional dependence* between members of a field, "the extent to which researchers have to use the specific results, ideas and procedures of fellow specialists in order to construct knowledge claims" recognized by their peers (p.88); and *strategic dependence*, which refers to "the extent to which researchers have to persuade colleagues of the significance and importance of their problems and approaches" (p.88). Although these two are interconnected, some fields may have a higher degree of the one and a lower degree of the other (p.89). Whitley also distinguished two aspects of task uncertainty: *technical task uncertainty* refers to "[t]he extent to which work techniques are well understood and produce reliable results" (p.121); while *strategic task uncertainty* is concerned with "uncertainty about intellectual priorities, the significance of research topics and preferred ways of tackling them" (p.123). These distinctions permit a 4x4 matrix in which 16 combinations can be identified. Eliminating non-viable or unstable combinations, Whitley arrived at a typology of seven major types of scientific fields, ranging from "fragmented adhocracies" (with low mutual dependence and high task uncertainty) such as management studies, to "conceptually integrated bureaucracies" (with high mutual dependence and low task uncertainty) such as post-1945 physics (pp.154-158). The main differences between the fields relate to intellectual aspects, "the configuration of tasks and problem areas", and social or institutional aspects, "coordination and control processes" (p.206). Whitley further considered how degrees of mutual dependence and task uncertainty are related to the internal organizational structure of scientific fields (chapter 5), and the contextual factors that affect the structure of scientific fields (chapter 6), in each case characterizing the seven major types of scientific fields in terms of these factors. The final chapter takes a diachronic approach to relationships between scientific fields and changes in the organization of the sciences (chapter 7). Although the distinction between the intellectual and social organization of the sciences is not reflected in the structure of Whitley's book, both the intellectual structures (including epistemological and methodological aspects) and the social organization (including institutionalization, identification and determination of

domain boundaries, formation of research groups or academic schools or departments, and control of access to resources) are dealt with.

In analyzing a field such as LIS some of the characteristics distinguished by Whitley can serve as indicators of levels of task uncertainty, mutual dependence and reputational autonomy in research fields. Examples are the degree to which research is personal and idiosyncratic (greater task uncertainty, less mutual dependence), extent to which researchers have to adhere to a dominant paradigm or program of research goals (less task uncertainty, greater mutual dependence) or the extent to which the language used is formal or esoteric (less task uncertainty, greater mutual dependence). Key variables were identified by Fry and Talja (2007), who summarized Whitley's theory in a table comparing fields of high mutual dependence and low task uncertainty with fields of low mutual dependence and high task uncertainty.

An important concept is that of *reputational autonomy*. A field which exhibits a high level of mutual dependence tends to deal with distinctive, highly specialized topics and to employ research procedures that are highly coordinated and standardized. Here there is limited scope, if any, for idiosyncratic, individualistic approaches, or for contributions by non-scientists such as laypersons or (by extension) practitioners in service professions. Such scientific fields are said to have a high level of reputational autonomy. On the other hand, a field which relies on theories and methods from other fields has a low level of reputational autonomy. Diversity of the organizational affiliations is an example of low levels of mutual dependency. Whitley (2000) categorized social sciences fields as fields with lower mutual dependency and higher task uncertainty than natural sciences fields such as chemistry and physics, for example, which have higher level of mutual dependency and lower level of task uncertainty. Weak sciences with a lower level of mutual dependency and a higher level of task uncertainty, such as LIS (Nolin and Åström, 2010), tend to have lower level of reputational autonomy. Reputational autonomy here refers to the control over resources, structure of organization, audiences, reward system and methods of evaluation. Overall, low levels of mutual dependency and high levels of task uncertainty are a consequence of lower levels of reputational autocracy and constitute evidence of fragmented adhocracy.

Upon reading Whitley's account of the characteristics of fragmented adhocracies scholars in the field of LIS are likely to recognize many of the typical criticisms that have been made of research in our field, as rehearsed for example in Powell and Connaway (2004, pp. 1-5;9-12). In fact, LIS appears to be a textbook example, and Åström (2007; 2008) and Nolin and Åström (2010) have discussed LIS as a fragmented adhocracy. With reference to the dimensions of mutual dependency and task uncertainty, Nolin and Åström (2010) referred to 'weak' and 'strong' sciences. Thus a fragmented adhocracy is

described as weak or as a science in crisis. LIS is categorized as a field of fragmented adhocracy because it faces increased competition from other fields and lacks theoretical development (Nolin and Åström, 2010).

Table 1: Suggested operationalizing framework.

indicator	variable	operationalization
Task uncertainty	Diversity of research topics	Greater diversity of research topics reflects lower task uncertainty
	Diversity of research methods applied	Greater diversity of methods reflects lower task uncertainty
	Characterization and description of the domain	Greater diversity in the characterization and description of the domain reflects higher task uncertainty
Mutual dependence	Patterns of authorship (single vs. multiple authors)	multiple authorship reflects greater mutual dependence
	State of professional LIS associations	active, well-organized and stable associations reflect greater mutual dependence
	Status of Arabic LIS journals	Regular and well-organized journals reflect greater mutual dependence.
Reputational autonomy	Affiliations of authors (academic vs. practitioners)	Predominance of academic-based authors reflects a higher degree of reputational autonomy.
	Affiliation of Arabic LIS departments (educational units)	Greater diversity of naming and affiliation of such departments reflects a lower degree of reputational autonomy.
	Characterization and description of the domain	Greater diversity in the characterization and description of the domain reflects a lower degree of reputational autonomy.

Because Whitley discussed "intellectual" or scientific fields rather than disciplines (p.7), his theory lends itself not only to comparisons between fields, but also to comparisons of the same field in space and time. This is shown by Whitley's use of examples such as German psychology before 1933, pre-Darwinian 19th century ornithology, and post-1945 physics (p.158). Thus Whitley's theory can be used to categorize and describe scientific fields in terms of their development in different countries or regions. In this study, it is used as a framework to help recognize and

understand variations of intellectual and institutional organization of the discipline within the Arab World and the wider international context, to determine how intellectual and social facets interact within the Arabic LIS, and to investigate whether the contextual factors affect the development of intellectual and social organization of the Arabic LIS. Overall, it is useful here as a framework for gauging the stage of development of a discipline (LIS) in a particular language/cultural/political area.

To do this we selected a number of indicators which might be useful in determining where LIS is positioned in terms of task uncertainty, mutual dependence and reputational autonomy (table 1). Together these indicators enable us to characterize Arabic LIS in terms of its intellectual and social organization:

Methodology

Firstly, a set of Arabic core journals (prestigious, most read, or most cited journals) in the field of Library and Information Science was examined. It was decided to include only current and accessible peer-reviewed journals. All issues of accessible journals, both print (cataloged and presented in the library shelves) and digital (available online through the Internet), published in Arabic in the Arab World in 1997, 2001, 2005 and 2009 were sampled. It was thought that the longitudinal approach of selecting issues with five-year intervals, starting in 1997, might help track and distinguish the changing characteristics of the LIS research in the Arab World. Sampling of articles took into consideration research papers only and excluded editorials, reviews, and translations from English. A content analysis method was applied in which articles were analyzed to identify the contributing factors mentioned in the following paragraph.

The classification scheme of Järvelin and Vakkari (1993) was used to identify LIS research topics and the research methods used. Although this scheme has been criticized (Rochester and Vakkari, 2004; Meng and Singh, 2007), the literature does not offer a more valid scheme to classify LIS topics and methods. Many studies in different contexts have used Järvelin and Vakkari's scheme for classifying topics and methods. Examples of these studies are Rochester and Vakkari (2004); Meng and Singh (2007) and Hider and Pymm (2008). In addition to the analysis of research topics and methods, we analyzed patterns of authorship (single/multiple) and affiliation of authors (practice/academia).

Secondly, an inventory of the Arabic LIS departments (LIS education units), professional associations, and current and ceased core peer-reviewed journals was compiled in order better to understand and describe the institutional organization and its interconnectedness with the intellectual organization of the scientific field. It was, by

and large, very difficult to collect precise data about most of the departments because many of them were not, or poorly, represented on the Internet. Therefore, we attempted to complete and verify data as much as possible through personal email correspondence with LIS academics from the Arab World. Tabulated data of LIS journals, professional associations and academic institutions are presented in the appendix.

Findings

This section contains analysis of data (see appendix for complete presentation of the data). It includes analysis of the sampled journals for the interpretation of the intellectual organization of the Arabic LIS. It also includes an inventory of the Arabic LIS professional associations, peer-reviewed core journals, and LIS departments for the interpretation of the social organization of LIS.

Arabic LIS Journals

An attempt was made to list all the Arabic LIS core journals, both current and ceased. Since most of the journals in the Arab World are published in print and not as e-journals, and given the geographic dispersion of their places of publication, it was difficult to cover all of the existing journals. Eighteen journals of a scientific nature were identified, twelve of which were currently published at the time of the study, and six of which had ceased publication after brief life-spans. These are listed in the Appendix in Table 7 and Table 8 respectively, where literal translations into English of their Arabic titles are given, except in the case of 'Cybrarian' which is published under an English title. A few other titles were identified but found to be merely magazines which usually publish columns and short illustrated articles about new trends and events in library and information science. These were omitted. For each title the tables list journal title, country of publication, year of first issue, numbers of issues in a single year, type of journal (print/electronic), and website if available.

Most of the current journals, except three relatively recent publications, are published in print in the traditional manner and do not have electronic counterparts or websites in the Internet for representation. The majority of the current journals is not widely distributed within the Arab World and is not likely to be widely accessible. Moreover, some journals appear irregularly, or only when a sufficient number of articles is available, so that they do not adhere to their intended periodicity. This is true of several of the journals in this study.

Bibliometric analysis of articles in Arabic LIS journals

Table 2 lists the sampled journals for this study. The selection of sampled journals was based on the availability of these journals in the main library of Sultan Qaboos University, Oman.

Table 2: sampled journals.

N	Title of Journal	Host Country	First Issue	Print/E	Website	Availability
1	Library Message	Amman, Jordan	1965	Print	None	Subscription
2	Journal of Arabic Libraries and Information	Riyadh, KSA	1982	Print	None	Subscription
3	New Trends in Libraries and Information	Cairo, Egypt	1994	Print	None	Subscription
4	Journal of King Fahad National Library	Riyadh, KSA	1995	Print + Electronic	Yes	Open Access
5	Arabic Studies in Libraries and Information Science	Cairo, Egypt	1996	Print	None	Subscription
6	Arabic Journal of Archive, Documentation, and Information	Tunisia	1997	Print	None	Subscription
7	Cybrarian	Cairo, Egypt	2004	Electronic	Yes	Open Access

This study sampled research articles published in seven major peer-reviewed Arabic LIS journals in a longitudinal perspective including years 1997, 2001, 2005, and 2009. Such longitudinal sampling was decided on in order to observe trends in research activities, if any.

Table 3 sets out the research topics dealt with in the sampled articles, using categories derived from Järvelin and Vakkari (1993) and following their system of numbering.

Table 3 shows that the largest category of research topics is 'library and information services activities' (37%), while next comes research on 'information storage and retrieval' (19%). The remaining topics attracted less interest. The least researched topic was 'research methodologies', with only two studies detected, in 2009. No major differences, however, were found across years that could highly be suggestive of a changing tendency in research topics.

Table 3: Research Topics of Sampled Articles.

Item	Research Topic	1997	2001	2005	2009	Total
100	Profession	4	5	13	6	**28 (7.5%)**
200	Library History	9	3	-	1	**13 (3.5%)**
300	Publishing (incl. Book History)	9	7	4	4	**24 (6.5%)**
400	Education in LIS	2	5	5	7	**19 (5.0%)**
500	Methodology	-	-	-	2	**2 (0.5%)**
600	Analysis of LIS (both empirical and theoretical)	1	2	6	4	**13 (3.5%)**
700	Library and Information Service Activities	30	30	39	39	**138 (37%)**
800	Information Storage and Retrieval	18	23	16	13	**70 (19%)**
900	Information Seeking and user studies	2	1	6	8	**17 (4.5%)**
1000	Scientific and Professional Communication	2	6	5	4	**17 (4.5%)**
1100	Other Topics in LIS	-	4	7	6	**17 (4.5%)**
1200	Other Discipline	1	4	8	2	**15 (4.0%)**
	Total	**78**	**90**	**109**	**96**	**373**

Table 4 sets out the research methods utilized in the sampled articles, using categories derived from Järvelin and Vakkari (1993) and following their system of numbering.

Table 4: Research Methods of Sampled Articles

Item	Research Method	1997	2001	2005	2009	Total
10	**Empirical Research Method**	**(37)**	**(23)**	**(48)**	**(59)**	**(167)**
11	- Historical	11	3	-	1	**15 (4.2%)**
12	- Survey	4	3	12	20	**39 (11%)**
13	- Qualitative	-	2	1	3	**6 (1.7%)**
14	- Evaluation	4	5	9	14	**32 (9%)**
15	- Case or Action	3	-	4	6	**13 (3.6%)**
16	- Content or Protocol Analysis	12	6	19	13	**50 (14%)**
17	- Citation Analysis	3	3	3	6	**15 (4.2%)**
18	- Other Bibliometric Method	-	-	-	-	**-**
21	- Secondary Analysis	-	1	-	2	**3 (0.8%)**
22	- Experimental method	-	-	-	-	**-**
29	- Other Empirical Method	-	-	-	-	**-**
30	**Conceptual Research Strategy**	**(0)**	**(1)**	**(4)**		**(5)**
31	- Verbal Argumentation, Criticism	-	-	-	-	**-**
32	- Concept Analysis	-	1	4	-	**5 (1.4%)**
40	**Mathematical or Logical Method**	**-**	**-**	**-**	**-**	**-**
50	**System/Software Analysis/Design**	2	1	1	-	**4 (1.1%)**
60	**Literature Review**	-	-	2	1	**3 (0.8%)**
70	**Discussion Paper**	17	24	23	14	**78 (22%)**
80	**Bibliographic Method**	5	4	2	1	**12 (3.4%)**
90	**Other Method**	-	-	-	-	**-**
00	**Not Applicable – No Method**	16	19	20	24	**79 (22.3%)**
	Total	**77**	**73**	**100**	**105**	**354**

Table 4 presents numbers and highlighted percentages of the most frequently utilized research methods. A total of 13 methods were identified in the sample. In the case of 79 articles (22.3%) no research method could be identified. In 167 articles (47.2%) a method was used that can be classified as Empirical in terms of the Järvelin and Vakkari scheme. The most used methods in this group were Content or Protocol Analysis (14%), Survey (11%) and Evaluation (9%). The only discernable trends over the study period were increases in the use of Survey and Evaluation methods. Almost (22%) of the total surveyed research papers were classified as a Discussion Paper, in which authors open a dialog discussing some trends, facts, concepts, or innovations in library and information science. On the other hand, the least undertaken methods were broadly those which Järvelin and Vakkari (1993) did not classify under empirical research methods, including 'system analysis/design, conceptual research methods, and secondary analysis'.

Table 5 presents data on the number of authors recorded per article and on the affiliations of the authors per year analyzed, with totals for the four years.

Table 5: Pattern of Authorship and Affiliation of Author.

Variable	**Pattern of Authorship**								**Affiliation of Author**							
Value	**Single**				**Multi**				**Academic**				**Practicing**			
Year	**97**	**01**	**05**	**09**	**97**	**01**	**05**	**09**	**97**	**01**	**05**	**09**	**97**	**01**	**05**	**09**
Total	**65**	**73**	**93**	**89**	**1**	**5**	**1**	**10**	**49**	**70**	**84**	**86**	**22**	**11**	**16**	**21**
Total (%)	**320 (95%)**				**17 (5%)**				**289 (80.5%)**				**70 (19.5%)**			

Results show an overwhelming tendency among authors in favor of single-authorship. There is very little evidence of collaborative research. Nevertheless, the result shows a slight difference as of year 2009 for an increase of multi-authored research papers. It was also found that academics publish more (80.5%) than practicing librarians do, with no discernable change over the period.

Arabic professional LIS associations

Twelve national professional LIS associations in the Arab World were identified (Appendix, Table 6). Of the twelve associations, four were established during the 1960s, which reflects positively on a drive for professional reorganization and reformation of LIS in the region. More countries later recognized the importance of establishing similar bodies to improve the LIS profession domestically. The past decade has witnessed the birth of the Library and Information Association of Kuwait in 2005 followed by the Omani Library Association in 2007.

Table 6: Arabic LIS Local Professional Associations

N	Library Association	Location	Year Found	Website
1	Lebanese Library Association	Lebanon	1960	http://www.llaweb.org
2	Jordanian Library Association	Jordan	1963	http://www.jorla.org [dead link]
3	Tunisian Association for Librarians, documentalists, and Archivists.	Tunis	1965	Not Available
4	Iraqi Association of Library and Information	Iraq	1967	Not Available
5	Syrian Association of Libraries and Documentation	Syria	1971	Not Available
6	Saudi Library and Information Association	Saudi Arabia	1981	http://www.slia.org.sa [dead link]
7	Egyptian Library Association	Egypt	1986	http://www.elaegypt.com
8	Sudanese Library Association	Sudan	1988	http://puka.cs.waikato.ac.nz/cgi-bin/sali/library
9	Bahrain Library Association	Bahrain	1994	www.bla-bh.org
10	Yemeni Association for Libraries and Information	Yemen	1999	http://www.yali.4t.com
11	Library and Information Association of Kuwait	Kuwait	2005	http://www.liak.org.kw [dead link]
12	Omani Library Association	Oman	2007	http://www.omanlib.org

The professional associations in the Arabic LIS are known to organize events and activities for the development of the LIS profession at exclusively national levels. These activities include organizing vocational training programs, organizing national conferences, and issuing publications including books, magazines or scholarly journals, and conference proceedings. However, in the case of some of the associations these activities are irregular or infrequent. Those which have already have websites on the Internet do not precisely depict and record their activities on a regular basis. Three of the associations do not have websites and another three have inactive Internet links. Information about their activities and roles in the development of domestic or regional LIS cannot be traced over the Internet and remains largely inaccessible.

In addition to the national associations mentioned above, there are two regional professional associations. They are the Arab Federation of Library and Information (AFLI), established 1986 in Tunis and the Arab Club for Information (ARABCIN), established in 1998 in Syria. They both have websites on the Internet to publicize their goals and activities. They both organize regional conferences and publish scientific journals. AFLI administers a peer reviewed journal entitled “E’ELAM” which is published

Table 7: Current peer-reviewed Arabic LIS journals

N	Journal Title	Location	First Issue	Issues Yearly	Type	Website
1	Library Message	Jordan	1965	4	Print	None
2	Journal of Arabic Libraries and Information	Saudi Arabia	1981	4	Print	None
3	Moroccan Journal of Documentation and Information	Tunisia	1983	4	Print	None
4	New Trends in Libraries and Information	Egypt	1994	2	Print	None
5	Journal of Information Science	Morocco	1995	2	Print	None
6	Journal of King Fahad National Library	Saudi Arabia	1995	2	Print + Electronic	Yes
7	The Iraqi Journal of Libraries and Information	Iraq	1995	2	Print	None
8	Arabic Studies in Libraries and Information	Egypt	1996	3	Print	None
9	Arabic Journal of Archive, Documentation, and Information	Tunisia	1997	4	Print	None
10	Cybrarian Journal [Same Eng. Title]	Egypt	2004	-	Electronic	Yes
11	Elam [Abbreviation of the Arabic title for the Association.]	Saudi Arabia	2007	2	Print	None
12	Information Studies	Saudi Arabia	2008	3	Print + Electronic	Yes

Table 8: Ceased Arabic LIS Journals.

N	Journal Title	Location	First Issue	Issues Yearly	Year Ceased	Type	Website
1	Libraries World	Egypt	1958	5	1969	Print	None
2	Journal of Arabic Library	Egypt	1965	4	1967	Print	None
3	UNESCO Journal of Libraries, Information, and Archive	Egypt	1970	4	1984	Print	None
4	Arabic Journal of Information	Tunisia	1977	2	-	Print	None
5	Annual of Libraries and Information	Saudi Arabia	1986	1	1999	Print	None
6	Alarabiya 3000 [Same Eng. Title]	Syria	2000	4	2006	Electronic	Yes

half-yearly, while ARABCIN published “Alarabia 3000”, a quarterly peer-reviewed journal between 2000 and 2006. It appeared irregularly. Only one issue was published in 2000 and also in 2003, while no issue at all was published in 2004. The last issue was

published in December 2006 before it finally ceased publication. However, the Arab Club for Information recently changed its name, objectives, interests, and specialties. As of May, 2010, it has been renamed the "Arab Revival Club" and after 12 years it is no longer dedicated to LIS in the Arab World.

AFLI has recently partnered with the King Abdulaziz Public Library in Saudi Arabia for maintaining publication of its journal, which is published in print and electronic versions. It was launched in 2007 on a half-yearly basis. However, there is no evidence that subsequent issues have been published. The King Abdulaziz Public Library website showed only the first issue with an indication that three more issues were in preparation. AFLI, however, has organized 19 regional conferences since its establishment in 1986. Conference proceedings are available solely in print and are distributed on-site pre-conference.

Arabic LIS departments

A total of 36 academic departments of LIS in the Arab World were identified, of which 14 departments are located in Egypt, 9 in GCC countries, and 13 in the rest of the Arab World (see Appendix, Tables 9, 10, and 11). In inventorizing these departments we experienced difficulties in locating relevant data and information. The IFLA *World guide to library, archive, and information science education* (Schniederjürgen, 2007) was also consulted for verification of data, but it is seriously lacking in sufficient and up-to-date data. For example, it listed only two of the 14 departments in Egypt.

Data were gathered and clarified by visiting the websites of each of those departments (a minority) which have websites in the Internet. Additional attempts to gather information about the departments were made using the Google search engine, searching in both Arabic and English, and by making contact with relevant people where possible, with a view to locating relevant information hosted anywhere in the Internet.

Some departments indicate that they offer Master and PhD degrees in Library and Information Science but provide no data available about these programs. It was noted that these departments appear to be very small, having only between six and nine faculty members and with the highest academic rank being an Assistant Professorship.

In the names of departments the terms *libraries*, *documentation*, and *information* appear to be used more or less indiscriminately. Although departments located in Egyptian universities look very homogeneous in terms of their educational programs and curricula, such indiscriminate use of terms also occurs in Egypt. Here the combination *Libraries and Information* is most often used (six times), whereas *Libraries*

Table 9: Academic LIS departments in Egypt.

N	Department	Affiliation	Country	Year Found	Faculty[1]	Professors	Programs	Website
1	Dept of Libraries, Documents, and Information	Cairo University, College of Arts	Egypt	1951	56	11	BA MA PhD	Yes
2	Dept of Libraries and Information	University of Alexandria, College of Arts	Egypt	1981	17	2	BA MA PhD	Yes Limited
3	Dept of Libraries and Documents	Benisuif University, College of Arts	Egypt	1985	35	2	BA MA PhD	No
13	Dept of Documents and Libraries	Tanta University, College of Arts	Egypt	1986	14	0	BA MA PhD	No
5	Dept of Libraries and Information	Menofia University, College of Arts	Egypt	1987	25	2	BA MA PhD	No
6	Dept of Libraries and Documents	Al-Azhar University, College of Human Studies	Egypt	1993	9	1	BA MA PhD	No
4	Dept of Libraries and Information	Helwan University, College of Arts	Egypt	1995	16	1	BA MA PhD	No
7	Dept of Libraries and Information	Sohag University, College of Arts	Egypt	1995	6	0	BA MA PhD	No
12	Dept of Documents, Libraries, and Information	Menia University, College of Arts	Egypt	1996	7	0	BA	No
10	Dept of Libraries and Documents	Al-Azhar University, College of Arabic Language	Egypt	1997	6	0	BA	No
8	Dept of Libraries, Documents, and Information	Assiut University, College of Arts	Egypt	1999	9	0	BA MA PhD	No
9	Dept of Libraries and Information	Ain Shams University, College of Arts	Egypt	1999	7	0	BA	No
11	Dept of Documents, Libraries and Information	Mansoura University, College of Arts	Egypt	2005	11	1	BA	Yes
14	Dept of Libraries and Information	Kafr Elsheikh University, College of Arts	Egypt	2006	4	0	BA	No

[1] All faculty ranks other than professor

Table 10: Academic LIS Departments in North African and Mediterranean Arab Countries

N	Department	Affiliation	Country	Year Found	Faculty[2]	Professors	Programs	Website
1	Faculty of Information and Documentation	Lebanese University, Faculty of Information and Documentation	Lebanon	-	-	-	-	No
2	Dept of Library Science	University of Algeria, College Humanities and Social Sciences	Algeria	-	-	-	BA	No
3	Dept of Information and Libraries	Almustansiriyah University, College of Arts	Iraq	1971	19	2	BA MA PhD	No
4	School of Information Science	UNISCO	Morocco	1974	-	-	BA MA	Yes (French)
5	Dept of Library and Information Science	University of Mentouri, Constantine, College of Humanities	Algeria	1980	9	6	BA MA PhD	No
6	Higher Institute of Documentation	Manouba University	Tunisia	1981	-	-	Diploma BA MA	Yes Limited
7	Dept of Libraries and Information	Damascus University, College of Arts and Humanities	Syria	1984	8	0	BA MA	No
8	Dept of Library and Information Science	University of Khartoum, College of Arts	Sudan	1985	7	0	BA MA PhD	No
9	Dept of Libraries and Information	Garyounis University, College of Arts	Libya	1985	16	2	BA MA	Yes
10	Dept of Libraries and Information	Neelain University, College of Arts	Sudan	1993	12	0	BA	No
11	Dept of Library and Information Sciences	University of Balamand, College of Art and Social Sciences	Lebanon	1993	4	2	BA	No
12	Dept of Library and Information Science	University of Philadelphia, College of Administrative and Financial Sciences	Jordan	1999	5	1	BA	Yes
13	Dept of Library and Information Science	Zarqa Private University, College of Educational Sciences	Jordan	2007	5	0	BA	Yes

[2] All faculty ranks other than professor

Table 11: Academic LIS departments in GCC countries including Yemen.

N	Department	Affiliation	Country	Year Found	Faculty[3]	Professors	Programs	Website
1	Dept of Libraries and Information	Sana University, College of Arts	Yemen	1971	5	0	BA MA	Yes Limited
2	Dept of Information Studies	Imam Muhammad Ibn Saud Islamic Uni, College of Computer and Info Sciences	Saudi Arabia	1973	42	3	BA MA PhD	Yes
3	Dept of Information Sciences	King Abdulaziz University, College of Arts	Saudi Arabia	1973	24	5	BA MA PhD	No
4	Dept of Library and Information Sciences	College of Basic Education	Kuwait	1977	20	1	BA	Yes
5	Dept of Information Science	Umm Al-Qura University, College of Social Sciences	Saudi Arabia	1983	23	0	BA MA PhD	Yes
6	Dept of Library and Information Sciences	King Saud University, College of Arts	Saudi Arabia	1985	20	5	BA MA	Yes
7	Dept of Information Studies	Sultan Qaboos University, College of Arts and Social Sciences	Oman	1987	17	1	BA MA	Yes
8	Dept of Mass Communication and Information	Qatar University, College Arts and Sciences	Qatar	1988	11	1	BA	Yes
9	Dept of Library and Information Science	University of Kuwait, College of Social Sciences	Kuwait	1996	13	2	MLIS	Yes

and Documents occurs four times, as does *Libraries, Documents, and Information*. Although Egypt has played a leadership role in establishing LIS education in the Arab World, the 22 departments located in the rest of the Arab World displayed much more variation. Nine variations were found, among which *Library and Information Science* was recorded nine times. In addition, two departments have recently changed their names to *Information Studies* and *Information Science*. In the Discussion below, an interpretation for such radical change will be suggested.

In terms of identity or affiliation, only one school is independent, the School of Information Science in Morocco, which is legitimized and sponsored by UNESCO. Two schools were found to be affiliated directly to a university. They are the Faculty of Information and Documentation in Lebanon and the Higher Institute of Documentation in Tunisia. The remaining departments form part of units of universities. There are eleven different forms of affiliation, with the majority (19) affiliated with colleges of arts. This is the pattern in Egypt, which has a homogeneous pattern (nine departments),

[3] All faculty ranks other than professor

while LIS departments in the other Arab States show more heterogeneous affiliations. Some of these appear unusual, for example departments affiliated with colleges of Arabic language, education, administrative and financial sciences, and computer and information sciences.

The oldest of the listed departments, the Department of Libraries, Documents and Information of Cairo University, dates back to 1951, while six were founded during the 1970s, 13 during the 1980s, (the largest group) and 11 during the 1990s, while the most recent decade witnessed the establishment of three more departments, two in Egypt and the latest (2007) in Jordan. (In two cases the foundation date could not be ascertained.)

Considering the qualifications offered, the majority of departments (twenty) do not have websites on the Internet at all, whereas three have partial or insufficient information. Fifteen of the departments offer BA, MA, and PhD programs, seven offer only BA and MA programs (one of these adding a diploma program), twelve offer only first degree (BA) programs, one offers only a MLIS (Master of Library and Information Science), and one provides no information.

The number of faculty members, including lecturers and professors, but excluding demonstrators (approximately equivalent to teaching assistants) and research assistants, ranged from 4 to 67. Twelve departments have fewer than 10 faculty members, eleven departments have 10-19 faculty members, six have 20-29, while three have more than 30 faculty members. The largest is the Department of Libraries, Documents, and Information of Cairo University, which has 67 faculty members excluding demonstrators.

Discussion

Results of the current study are discussed in light of Whitley's theory of the intellectual and social organization of the sciences, with particular reference to the two dimensions which he identified, namely the mutual dependency among researchers and the uncertainty of the research tasks or functions. Although Whitley's matrix of classifying research disciplines was highly dependent on deductive reasoning, subsequent calls for empirical studies that describe and analyze research fields in terms of Whitley's theory should be considered important. In addition to Whitley's theory, which forms the basis for this discussion, other literature analyzing LIS research in different contexts and geographical areas is also taken into account.

Social Organization of the Arabic LIS

According to Whitley (2000), social organization of the sciences refers to the formation, structuring, and development of the research organizational entities of a discipline or science. These entities include the identification and determination of

domain boundaries, resources allocations, research organizations, scholarly communication channels, and degree of integration into a university schools or departments (Rochester and Vakkari, 2004).

LIS in general has developed out of practice (Audunson, 2005; Åström, 2008; Feather, 2009; Sugimoto et al., 2009; Nolin and Åström, 2010). For example, the United States, which witnessed the birth of the first library school of its kind worldwide in 1887 at Columbia College, had eleven years earlier formed the American Library Association and established the "Library Journal" (Sugimoto et al., 2009). According to Nolin and Åström (2010) this structure has made LIS dependent on practice, in which its domain boundaries have not been clearly delineated and are subject to disagreements and variations.

LIS in the Arab World was no exception to this pattern. The first academic department of its kind was established in 1951 in Cairo University, although LIS practice had been documented hundreds years earlier when mosque, palace, and research libraries played distinguished roles in the development of Arab-Islamic civilization (Green, 1988). As elsewhere, in Egypt the practice of librarianship, as a contemporary profession, preceded the formation of the first academic unit for the discipline by about 20 years, the Central Library of Cairo University being opened in 1931, twenty years before the formation of the first LIS school there.

Arabic LIS itself has not developed out of vacuum. As in other developing countries, its disciplinary development constituted recognition of similar progress in the developed countries such as Western Europe and North America (Johnson C. A., 2007; Johnson I., 2008). But the institutionalization and educational organization of these disciplines in the Arab World has remained largely unchanged. For instance, while most schools in the United States and England offer graduate programs only, only one of the LIS schools in the Arab World has discontinued first degree programs. This indicates that the rate of change is very slow compared to that in many institutions around the world. Moreover, many schools in Europe and North America, for example, have changed their names to reflect changes in the practice and new technological developments. In the Arab States the nomenclature varies considerably. The names of LIS departments in Egypt are much more standardized while those of departments in the rest of the Arab States differ from one another.

According to Whitley (2000), the ability to control the field or the representation of the domain is essential for the reputational autonomy of a field. Variations or diversity in the characterization and description of the domain increase the possibility for external entities to control the levels and types of work, which ultimately indicates a high level of task uncertainty. The terminological formalization of departments' names should reasonably emphasize the educational programs and types of degrees and

taught courses. Although the study at hand did not include analysis of programs and taught courses, good examples could possibly be the Department of Information Science at Umm Al-Qura University in Saudi Arabia, which changed its name in 2003 from Department of Libraries and Information by omitting the word "libraries", and the recent change of the name of Sultan Qaboos University's Department from "Library and Information Science" to "Information Studies". As shown in its program objectives, the objectives of two out of four programs in the Department of Information Science at Umm Al-Qura University still emphasize the words libraries and library services.

Some LIS institutions in Nordic countries also eliminated librarianship from their names, to signify their devotion to the more scientific discipline of information science, although there has not been a corresponding change in the curriculum (Audunson, 2005). Dropping the word "Library" is a common phenomenon, with almost one third of schools in North America having changed their names. This trend is continuing, with the School of Communication and Information at Rutgers University as a recent (2009) example (Schement, 2009).

In the case of the Arab World, Gdoura (2008) proposes a different interpretation for how departments' names or titles are chosen. He indicates that using the concept "information" in titles implies recognition of the information field as a discipline. This was the case for the majority of Arab North African institutions, which first started solely with "Library and Documentation", except where in a few departments the "information domain has not reached the status of a science" (p. 173) yet. Nevertheless, in the Arab World as Gdoura (2008) indicates, changing names from "Library and Documentation" to "Library and Information" has never been easy, as controlling bodies repeatedly resist such a change. Gdoura (2008) cites as an example that specialists in Tunisia have been struggling for 10 years now to convince the university administrative authorities to modify the name of the Tunisian "Higher Institute of Documentation". Whitley (2000) observes that such external control lessens the reputational autonomy of the scientific field. Conversely, changing schools' names, in one way or another, is a way of survival for these schools. The profession is changing just as societal needs are responding to advances in technology and economy.

Institutionalization of LIS is diverse around the world, with three widely distinguished variations. They are: departments at university faculties or colleges, university faculties, or entirely independent institutions. Almost all of the Arab academic departments developed within an academic regime that belongs to the wider faculties or colleges of arts, or humanities and social sciences. However, in the Arab World there are no structural differences between a college of arts and a college of humanities and social sciences. The only exceptional case is the Moroccan School of Information Science which was first established by the UNESCO in 1974. Although affiliation is quite

heterogeneous across countries in the Arab World, it is rather homogeneous in cases like Egypt and Sudan, for example, where the affiliation is to colleges of arts.

For the other countries, we find some departments attached to computer and information sciences, educational sciences, and administrative and financial sciences, but the majority is still affiliated with arts or social sciences. Only two schools out of the total listed departments (36), are attached directly to a university structure as a university faculty. It can overall be concluded that the vast majority of these departments are small entities sharing similar institutional structures, and which have to share facilities and resources with other departments in the same college. According to Whitley (2000), such a structure of institutionalization reflects a low level of reputational autonomy, making it easier for other disciplines or entities to have control over those departments' resources, funds, and structure. Such a structure, furthermore, affects the levels of coordination, task processes and organizational goals (Whitley, 2000; Åström, 2008). However it should be noted that this type of structure or institutionalization is very common for LIS worldwide except in North America and West European countries, where LIS units are better recognized.

Research funds and access to key resources is one of the main aspects discussed by Whitley (2000) in relation to reputational autonomy in the development of scientific fields. Generally, library and information science research lacks sufficient funding resources (Connaway, 2005). Nevertheless, research funding varies considerably between developing and developed countries. While there are many opportunities available for researchers to gain access to resources and research funding in the United State, for example, through diverse means of cooperating organizations and private institutions (Mathews, 1991; Young, 1991; Connaway, 2005; Hahn, 2008), these opportunities, in contrast, are very scarce in the Arab States (Abdul-Hadi, 2001; Gdoura, 2008).

Abdul-Hadi (2001) attributed the lack of funding resources to lack of awareness and recognition of LIS generally in the Arab World. Åström (2008) observed a similar situation in the Nordic countries where funding resources have not been adequate for most LIS institutions. However, the very small number of articles found in our study that had been authored by more than one author suggests that a scarcity of research grant funding for LIS in the Arab World inhibits collaborative research projects, as will be argued below when we consider the intellectual organization of LIS. There is generally no indication of specific research agendas or research groupings in the Arabic LIS.

Whitley (2000: 221-223) sees the involvement of laypersons (under which he seems to include professional practitioners) as being associated with lower levels of reputational autonomy, particularly when lay groups are able to influence decisions on what the important problems in a field are and are able to influence the way the field

delimits its domain, determines its problems and develops its terminology. However we would argue that in LIS professional associations have historically contributed to raising public awareness of the profession and to enhancing the legislation and standardization of LIS at local, regional or international levels. In promoting the professionalization of practitioners and a research-based approach to professional problem solving, they contribute to enhancing the reputational autonomy of LIS. Among the Arabic LIS professional associations, only two bodies were identified as active in this respect. They are the Arabic Federation of Library and Information (AFLI) and the Egyptian Library Association. The other associations are "less dynamic even on a professional level, and have little interest in scientific activities" (Gdoura, 2008, p.174). The majority of the associations currently in existence have not been represented on the Internet and their contributions remain largely unknown or inaccessible. The modest involvement and contribution of these associations can be attributed to the influence of political agendas in the region (Gdoura, 2008).

Intellectual Organization of the Arabic LIS

The major scholarly communication channels for LIS in the Arab World are journals and conference proceedings. Book chapters occur less frequently among the intellectual products of LIS researchers in the Arab World. All of the Journals are published in Arabic. A few journals also publish articles in English or French, but with a limitation of one article in an issue. This study shows an overall growth in the number of refereed journals. The majority of the journals (nine) were launched during the last two decades, during which only two journals were found to have ceased publication. This must be seen against the background of the increase in the number of international journals in LIS (Sharma, 1999; Wani, Bakshi, and Gul, 2008). The major problems associated with most of the Arabic LIS journals are irregular publication, unbalanced size and length of articles, lack of indexing services, and limitation of readership as most of them are still published traditionally. This study confirmed the prevalence of such complications in the LIS scholarly communication system of the Arab World. This has also been found in other studies in the overall humanities and social sciences disciplines in the region (Nasser and Abouchedid, 2001; Qasim, 2005; Gdoura, 2008; Al-Aufi and Al-Harrasi, 2010). The state of that current system of scholarly communication is an indication toward maintaining a low level of reputational autonomy of LIS in the Arab World.

Seeing that language plays a major role in how LIS research is organized, It is important to mention that all LIS departments in the Arab World use Arabic as the prevailing language for both teaching and scholarly communication, except the Moroccan School of Information Science where French is the major language of teaching

and research. It is, therefore, not surprising to find little or no concern among Arabic LIS researchers for publishing in foreign languages, including in the major LIS journals published in English. Most of the English-based literature in LIS that is published by Arab researchers has been produced by scholars living in foreign countries, mostly Western Europe and North America, or by post-graduate students studying in English-speaking countries who have gained the confidence to publish parts of their dissertations in English and perceive this as a means of increasing international accessibility of their work. This is supported by findings of Arabic bibliometric and analytical studies, for example those of (Al-Abbas, 1996; Abdul-Hadi, 2001; Mahmood, 2005; Aljawhari, 2009).

However, the reluctance to publish in other languages tends to isolate Arabic LIS as a discipline of a distinctive intellectual structure, which is out of step with ongoing tendencies in other non-English speaking parts of the world, such as the Nordic countries, Western Europe, and South and East Asia. In these countries there is a great concern for scholarly communication and recognition that it is heavily dependent on the use of English. Examples are (Aarek et al., 1992; Åström, 2008; Gunasekera, 2008; Patra and Chand, 2009; Meng and Singh, 2007; Wani et al., 2008). Considering this predisposition in light of Whitley's theory, audience plurality and diversity in Arabic LIS must be considered low and much constrained. Therefore, the interaction with the wider international LIS discipline remains inadequate, which suggests a high level of task uncertainty with a concomitant low level of mutual dependence in Arabic LIS.

In terms of research topics and the research methods used, the findings of the current study strongly suggest that LIS research in the Arab world is still in a growing phase that reflects a degree of structural and cognitive immaturity. In this connection, only two relevant empirical studies in the Arabic LIS literature were identified. Mahmood (2005) analyzed the distribution of research topics in the Egyptian LIS research from 1996-2000, while Al-Amoodi and Jawhari (2009) analyzed, in addition to research topics, which research methods were used in three Arabic LIS journals from 2003-2007. The results of the current study confirm those of Mahmood (2005) and Al-Amoodi and Jawhari (2009), although both studies used different, non-identical, classification schemes for the distribution of research topics. They found the most frequently researched topics to fall in the areas of in 'information service activities' and 'Information storage and retrieval'. The results also confirm the distribution of research methods found in Al-Amoodi and Jawhari (2009), where the majority of studies indicated non-use of methods (37%), and where for those studies which did use methods, 'survey' (descriptive) research was the most frequently reported (31%), in contrast with, for example, 'system design/analysis' (0.9%).

In non-empirical studies, Abdul-Hadi (2001) stressed that topics which are considered to be new in the developed countries, have enjoyed no similar and

simultaneous interest in the Arab World. In the Arabic literature studies in relation to research methods, theoretical construction and advancement, concept analysis, and information systems design and analysis are uncommon. In addition, he indicated that the Arabic LIS research is generally poor in terms of using systematic methodological structure. Gdoura (2008) also indicated inadequate attention to research structure in the Northern African Arab countries, stating that "Arab [LIS] researchers do not care much about epistemological and methodological questions" (p. 175).

Comparing the results with those of studies conducted earlier could be of limited relevance due to the passage of time, but it is necessary to indicate that the findings of the current study showed some particular similarities and differences in comparison with relevant studies conducted almost two decades earlier. While we found similarities in the distribution of research topics, as both 'information storage and retrieval' and 'information service activities' were found to be the most frequently researched topics, there were also differences in respect of research methods, as 'conceptual research method' was indicated to be the most frequently applied methodology (Aarek et al., 1992; Rochester and Vakkari, 2004).

Patterns of authorship also reflect the degree of mutual dependency in a discipline. Multiple authorship is more common with fields of high levels of mutual dependence, while fields with low levels of mutual dependence are more hospitable to contributions by individual scholars who are not working within group structures. The results of this study indicate a very strong preference among researchers for single authorship (95%). The culture of multi-authored or collaborative research has been generally absent in the Arabic context of LIS. Looking at the affiliations of the authors of the 5% multi-authored articles, we found that they belong to the same institution or country, which indicates that regional or international collaboration is almost non-existent. Relevant literature from the Arab World has recorded such a tendency. Mahmood (2005), who investigated the intellectual productivity of LIS in Egypt between 1996 and 2000, indicated that joint authorship research counted for only 10%. Based on earlier studies he also reported that co-authored intellectual productivity in LIS accounted for only 5% of the total LIS publication record in Egypt. Abdul-Hadi (2001) also stressed the prevailing trend of single authorship in the Arabic LIS.

Other studies in regions like the Nordic countries and India, for example, have also shown such a preference on single-authorship, but to a lesser extent than in the Arabic context (Patra and Chand, 2009; Åström, 2008). Other research has, in contrast, demonstrated a prevailing trend toward collaborative research, which is reflected in the increasing number of co-authored research papers (Tiew et al., 2002; Ocholla and Ocholla, 2007). Moreover, a recent study surveying the whole Asian LIS literature indexed by the *Social Science Citation Index* of Web of Knowledge between 2001 and

2007 indicated an overall growing trend toward collaborative research authorship (Mukherjee, 2010).

The results also indicate that academics (80.5%) dominate the intellectual productivity of LIS, while practitioners produce, in return, as little as 19.5%. This finding can be interpreted in two ways. On the one hand, the involvement of practitioners in publishing research is to be welcomed in that it favors evidence-based practice. On the other, from the perspective of Whitley's theory relating to reputational autonomy, a high degree of contribution to the research literature by lay persons is seen as evidence of low reputational autonomy. To the extent that publishing by practitioners is beneficial for the development of LIS in the Arab World, we note the lack of incentives or encouragements for practicing librarians to be involved in the research process. Such involvement remains obligatory for academics, mainly, for the purpose of academic promotions. Moreover, research focused on solving or dealing with local research problems (problems limited to a single country), which accounted for 38.5% of the articles, tended to report on empirical investigations, while the majority (61.5%) of articles dealt with broader issues, generally in the format of discussion papers or research lacking an identifiable method.

Summary

The overall results of the current research suggest that an association exists between the level of social organization of the Arabic LIS and its intellectual organization. The social organization of the Arabic LIS, as reflected in the types of affiliation and lack of resource accessibility and funding, can be described, according to Whitley (2000), as relatively weak. Whilst our data do not allow us to establish a causal link, it is striking that the weaknesses we have identified in the social organization of Arabic LIS are accompanied by weaknesses in its intellectual organization, which is dominated by uncertain research topics and methods (professionally oriented research topics and non-systematically oriented research methods) and single-authored publications.

Leaving aside the current intellectual and social structure of LIS in the Arab World and considering the field internationally, LIS has been described as a "fragmented adhocracy", with high levels of task uncertainty, low levels of mutual dependency, and a lower degree of reputational autonomy (Whitley, 2000; Hjorland, 2000; Åström, 2007; Åström, 2008), a discipline originating out of practice and adapting its methodological construction from other disciplines such as sociology, history, and psychology (Feather, 2009). According to Nolin and Åström (2010), the major problem of LIS is its disciplinary variation and non-standardized terminology, which in turn affect negatively the reputational autonomy and increase task uncertainty, as posited in Whitley's theory. We

note in passing that Gibbons et al. (1994) have suggested that such "weakness" should be considered as normal in the post-war development of the sciences, where LIS could be seen as a 'Mode 2' discipline in terms of theory that describes sciences from the perspective of heterogeneity and trans-disciplinary relations (Gibbons et. al., 1994). A discussion of this perspective is beyond the scope of this article.

From our perspective Arabic LIS needs to be part of reconstruction in the overall higher education dispensation of the Arab World. To help alleviate the problems that constrain the development of higher education in the Arab World, it has been recommended that Arab countries should adopt new teaching and learning methods, and in particular utilize new technologies in support of good scientific practice and the development of high-level research, analytical and thinking skills. It is also recommended that Arab countries should implement policies, legislation, and quality assurance measurements to ensure an appropriate level the accountability for higher education institutions in the Arab region (UNESCO, 2003).

For the development of Arabic LIS in particular, it is recommended that the Arabic LIS institutions should build and foster regional and international collaboration in order to construct a well-organized social structure for LIS, which in turn will be conducive to progress in the development of a sound intellectual structure for the field in the Arab World.

Further research taking into consideration other theoretical frameworks such as those of Normative Values or Paradigm Shifts is required for the purpose of comparisons and confirmations as the result of this research remains largely suggestive.

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