What Do They Want? - A Study Of Changing Employer Expectations Of Information Professionals

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WHAT DO THEY WANT? - A STUDY OF CHANGING EMPLOYER EXPECTATIONS OF INFORMATION PROFESSIONALS.

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Abstract

This paper reports the findings of an exploratory study of position vacant announcements appropriate for library and information studies (LIS) graduates appearing in the *Sydney Morning Herald* over a four week period in each of the following years: 2004, 1994, 1984 and 1974. The period studied witnessed change-demanding developments in information technologies as well as changes in workplace conditions and client expectations. The study collected data on the demands of employers as expressed through job advertisements that included data on work status (full-time, part-time, contract, casual), qualifications and the experience required of the information professional at the selected timeslots. To investigate similarities and differences between periods a content analysis and co-word analysis of the job advertisements was undertaken. The ads indicated a movement from simple advertisements in 1974 inviting applications for reference or technical services librarians, to complex and specialised positions being advertised in 2004 where the most called for attributes were interpersonal skills and behavioural characteristics.

Introduction

The thirty years from 1974 to 2004 have witnessed changes in information technology and information delivery. These years have also seen substantial change in the Australian workplace where industrial relation reforms have led to changed conditions of employment, a major one being a move to a more casualised workforce. The education of LIS personnel has also undergone substantial change; not only did the 1970s see the growth of professional LIS programs in Australian tertiary institutions but also the beginnings of formal programs for library technicians in Technical and Further Education (TAFE) colleges [1]. All these factors have influenced jobs and the content of job advertisements.

This study looks at job ads to see what they can tell us about how jobs for librarians have changed over the last thirty years. Some of the questions addressed include the following:

　　a) Who employs librarians and information studies (LIS) professionals?

b) What requirements do employers have of librarians with regard to work status, experience and qualifications?
c) What LIS knowledge, other competencies, and interpersonal and behavioural characteristics do employers list in job ads for professional librarians and has this changed over time?
d) What does this mean for the future of LIS professionals?

Few LIS practitioners would deny that the workplace has undergone substantial change over the three decades (1974 to 2004) considered in this investigation. This change has been both in the work undertaken and in the conditions under which people are employed. The study reported here has gathered data on the extent and nature of this change from job advertisements (job ads) for librarians and information managers during a four-week period in 1974, 1984, 1994 and 2004. Job ads provide an insight into the workplace even though it must be acknowledged that a job ad indicates only what an employer explicitly says is required rather than what is actually wanted or received. Job ads serve other purposes. While they are basically designed to attract the best possible staff member for the position, they also provide graduates, school leavers and the world at large with an opportunity to examine the working conditions, salaries, qualifications and career paths for a field or a profession [2]. As this project sought to track change, job ads at various periods provided a good vehicle for doing so. Data were gathered from only one newspaper in one city, the *Sydney Morning Herald* (*SMH*), however, as Sydney is the largest city in Australia and a major commercial centre, it should provide a picture from which general trends may be extrapolated.

The data gathering focussed on positions calling for professional level LIS skills. When ads did not specifically mention the word "librarian", the researchers used a mix of the available information including position titles, required qualifications, work descriptions and salary level to determine in cases of doubt, whether a position was at a professional level. The intention to include any identifiable non-traditional positions in some cases necessitated the use of all of these various guidelines. Broadbanding[1], an industrial relations reform of the 1990's, has led to some positions being advertised as suitable for paraprofessional or professional applicants and these positions have been included.

Background
In Australia there is a professional LIS association, the Australian Library and Information Association (ALIA), which accredits entry-level professional LIS programs. Programs are

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[1] A pay strategy that consolidates a large number of relatively narrow pay grades into much fewer broadbands with relatively wide salary ranges

currently based in universities. Entry-level programs exist at undergraduate level (almost all of three years full time duration), postgraduate diploma (one year full time duration) and masters level (one and a half years full time duration)[2]. This is different from other countries such as the United States of America (USA) where the American Library Association (ALA) accredits the one qualification, the masters degree [3].

Most Australian permanent positions are advertised in newspapers and/or their associated web sites (which have only been available over the past ten years or so). Previously positions were also advertised in professional newsletters, over e-lists, and via a number of other sources. Newspapers thus provide the one source of advertised positions that has been available consistently over the period studied. Industrial relations legislation encourages public advertising of positions in publicly funded libraries, which includes most academic libraries. Non-permanent positions in all sectors and special library positions in corporations do not have the same requirements; however, special libraries do often advertise directly or use job placement agencies that advertise when necessary. Increasingly the trend is for print ads that refer potential applicants to web sites for further information, or indeed for the facility to apply online.

Literature Review

There is an extensive international literature on LIS jobs and a not insignificant number of Australian based studies. Some studies have focused on the extent and vitality of the employment market, usually investigating the employment opportunities for new LIS graduates. Other studies have focused on the knowledge and skills mix desired and/or required by employers.

A number of Australian and international LIS schools have surveyed recent graduates, gathering data on their early employment experiences. These studies have usually had multiple functions, collecting data useful for developing curricula as well as information about the LIS graduate employment market. In the United Kingdom, the Department of Information Studies at the University of Sheffield has tracked its masters programs graduates for more than thirty years maintaining that these ongoing investigations have been valuable in developing curricula relevant to the changing LIS workplace [4, 5]. They found examples of changing demands over a fifteen year period, including an increase in the proportion of new

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[2] Additionally, ALIA accredits programs equivalent to two years full-time study at technical colleges for paraprofessional staff (library technicians).

graduates whose first positions involved user education (10% for graduates of the period 1979-85, 68% for those of 1986-89 and 59% for those of 1990-93); and a substantial change in the requirement to be involved in management activities (28%, 50% and 50% respectively for the three periods) [5].   Perhaps not surprisingly, the report of the findings of the survey of their MSc graduates for 1994-96 reported that "use of the Internet, practical computer skills and database design" were the elements of most use in their jobs [6].

Following the growth of Australian LIS schools in the 1970s, and influenced by Moore [7] and others who wrote of an emerging market of non-traditional jobs, the 1980s saw a number of papers which sought to assess both the traditional and non-traditional markets for LIS graduates.   Job ads were the data sources for studies by Schauder [8] and Middleton [9] while Australian LIS school data was used by Rochester [10] and the data from one school by Willard [11].   The 1990s produced similar Australian investigations with Brittain [12] analysing job ads and Genoni, Exon and Farrelly surveying LIS graduates [13].   More recently Willard, Wilson and Cole [14] and Middleton [15] have gathered data on the work performed and the skills required in jobs held by LIS graduates. These Australian studies have taken snapshots rather than gathered longitudinal data. Generally, these studies found that penetration by LIS graduates in emerging, or non-traditional, employment markets was low with modest increases over time. Most also found an increasing requirement for skills in information technologies, and behavioural characteristics and communications skills in both traditional and non-traditional job markets.

In similar studies in the USA, Xu [16] analysed job ads in *American Libraries* over the period 1971 to 1990 to assess the effect of automation on job requirements for cataloguers and reference librarians. He found an increasing demand for computer skills in both areas and for bibliographic instruction duties for reference librarians. He noted that the demand for oral and written communication skills first appeared in his data period 1976-80. Heimer [17] also used job ads from *American Libraries* investigating the period January 1989 to December 1998. Her focus was electronic librarianship, a type of job that she believed spanned reference and library systems work. The results supported her contention that jobs were occurring which required skills in reference and technical support as well as roles in collection development and instruction. Liaison was the most cited interpersonal demand, occurring in 53% of cases and training was specified in 49% of cases. Another American study using ads from *College & Research Libraries News* for the period 1990-

2000, also found an increasing number of electronic or digital positions and that the latter had more administrative and supervisory responsibilities [18]. The duties of instruction/training and collection development liaison occurred to a similar extent in both types of positions. A 2000 investigation of 250 American online academic librarian job ads revealed requirements for technical skills, interpersonal and behavioural skills, and service delivery competencies [19].

White [20] used job advertisement data for 1990 to 1998 to research American academic subject specialist positions. He found an increasing demand for technology-related skills; however, reference desk services, bibliographic instruction and collection development were also frequently specified. Most ads cited communication as a required skill and that a Masters in LIS was also a requirement for most positions. Lynch and Smith [21] looked at American academic jobs between 1973 and 1998 and found that, by 1998, academic library jobs routinely included computer technologies, that instruction was now part of reference work, and that behavioural skills, most commonly oral and written communication skills, had emerged as job requirements. The authors concluded that jobs in academic librarianship were shifting from definition along traditional functional lines to jobs combining tasks from more than one functional area.

Other international research has produced a picture of the job market that shares similarities with the American results. A study of position ads in two major Irish newspapers revealed the importance of communications and information technology skills [2]. The librarian's instructional role was investigated by Clyde [22], who for three months in 2002 monitored LIBJOBS, the international listserv of the International Federation of Library Associations (IFLA). She found that approximately half the positions (150 of 291) included a component of education and training. The most frequent specification was for bibliographic/library instruction (47%) with the training of library and other staff occurring in 34% of the ads. Information literacy/information skills instruction was noted for 15% of the positions. Two-thirds of university and college libraries listed instructional tasks while 18% of public libraries and 17% of special libraries did so. Myburgh [23] found that attributes quite different to established "core knowledge" were called for in her study, with technology and technological expertise featuring frequently, as in other research.

Another strand of literature addresses the competencies that LIS professionals should possess. In some cases the impetus for this development has been professional associations, for

example ALIA's "The library and information sector: core knowledge, skills and attributes" (http://www.alia.org.au/policies/core.knowledge.html) and the American Special Library Association (SLA) (http://www.sla.org/content/learn/comp2003/index.cfm). Library educators have also sought to identify competencies as input into program development [15, 24, 25]. As with other areas of library and information work, the demands of new information technologies has influenced required competencies and associated research. Tennant [26] listed skills he believed were necessary for those managing digital collections and services. In an earlier paper [27], he acknowledged the speed of knowledge and skill obsolescence and presented a list of personal characteristics (e.g. flexibility, good interpersonal skills) he believed employers should be seeking.

In summary, the studies reviewed generally found an increase in required computer and IT skills. They also revealed increased requirements for particular behavioural characteristics and interpersonal skills in addition to professional competencies. Bibliographic instruction (in Australia more commonly referred to as information literacy programs) is an important part of many LIS positions. Collection development was also frequently identified as a required area of expertise.

Research Method

This study collected a snapshot of 135 job ads appearing in the *SMH* newspaper during a four-week period over August and September in each of the years 1974, 1984, 1994 and 2004. It is recognised that other resources are used to advertise jobs and recruit librarians, such as professional newsletters, online e-lists and web sites, specialist and generalist recruitment agencies etc. however, newspapers were chosen as the data source as they are one readily available source that has existed in all the time periods studied. The *SMH* is a city-based newspaper, and job ads appearing in it are generally localised to the city or state, although occasionally job ads for positions further afield were encountered. Job ads included in the study were those that either specifically asked for a librarian or professional LIS qualifications or, while not specifically asking for an LIS qualification, clearly used professional level LIS skills. Following the approach of an earlier ALIA study [28] duplicate job ads were eliminated. The job ads from the earlier years had to be sourced from microforms of the newspapers, a particularly onerous task; those for 2004 were gathered during the study period.

Initially the job ads were visually scanned and the information from them tabulated to summarise total numbers, location, type of employer, job skills, nature of work contract and experience required.

Ads were then either scanned or typed into text (depending on the quality of the microform copy) and input into the content analysis software package, Wordstat [29]. A categorisation dictionary (see Table 1) was created from a combination of sources including (a) frequency counts of the most commonly mentioned relevant terms in the ads, (b) the literature review and (c) the authors' knowledge of the LIS industry. The subject index of *Library and Information Science Abstracts* (LISA) assisted with the creation of synonyms and the allocation of terms to categories.

Table 1. Content analysis categories	
Category label	**Examples of dictionary terms**
Archives & records management	Archives, Dataworks, Documentum, EDMS, records management ,
Behavioural characteristics	Business acumen, charismatic, committed, creative, energetic, independent, integrity, leadership, sense of humour, self-motivated,
Client services	Children's, customer, outreach, public service, remote, service delivery, user service
Common workplace requirements	Anti-discrimination, equal opportunity, diversity, equity, ethics, health and safety
E-resources	Bloomberg, CDROM, Datastream, Dialog, Digital, Electronic, Factiva, Online,
Environment	Cutting edge, demanding, diverse, fast-paced
Generic IT skills	FTP, MS Office, Word processing, spreadsheet, telnet,
Generic skills	Copyright, drivers licence, legislation, lifelong learning
Hardware	Information technology, TCP
Information services	Bibliographic instruction, information literacy, reader education, training program, user education
Integrated library systems	Automated library systems, Automation, DB Textworks, Ex Libris, Innopac, library management system, Unicorn, Voyager
Interpersonal skills	Co-operative, coach, collaborative, negotiation, communication (oral, written, presentation), cooperative, liaison, listen
Knowledge management	KM, knowledge management
Management	Financial management, human resource management, supervision, staff training, marketing, performance review, project management, quality control, strategic planning
Programming languages	HTML, Java, Linux, Perl, SQL, Unix, XHTML, XML
Reference services	Database searching, information searching, information retrieval, information service, internet search, literature search, reference
Technical services	Cataloguing, AACR, Bibliographic utilities, collection management, database management, ILL, metadata, serials
Web design and maintenance	Content management, Internet, intranet, content developer, WCMS

The categorisation dictionary of 18 broad categories was then run over a database of the text from the job ads for each year to identify the frequency with which specific categories were listed in the ads.

While frequency counts are themselves a measure of importance, the Wordstat software also allowed us to perform cluster analysis and multidimensional scaling (MDS), which our investigation led us to believe would expose the underlying structure of the job ads and therefore the job market. The desired result from these techniques is a co-occurrence profile for each category term. The cluster analysis is based on the pattern similarity (or correlations) of the 18 categories in the dictionary. One output of a cluster analysis is a dendrogram, which is a graphical display of the clustering process. The hierarchical agglomerative clustering approach used in this research begins by joining two terms with the most similar patterns according to the distance criterion (average linkage). Subsequent terms are joined to the existing clusters and clusters may be joined until there is one large cluster that encompasses the entire set of terms. There is no best number of clusters, and informative pictures emerge from the data at different points in the different years.

The MDS uses the same similarity (correlation) matrix as the cluster analysis to study the underlying structure of the data. Often used jointly with cluster analysis, MDS produces a two- or three-dimensional graph or "map" in which the co-occurrence patterns are represented as lying close to each other on the map while terms with dissimilar patterns are placed far from each other. An optimal MDS solution is where the RSQ (the amount of variance explained by the solution) is high and the stress (the amount of distortion of the data required to fit the solution) is low.

Results

A total of 135 position ads were studied, spread over the four snapshot periods. Anecdotal evidence suggested a decline in the number of positions available by 2004 from 1974, a situation that is not supported by the numbers (Table 2). Of course as data was collected over the same short period (four weeks from mid August-mid September) for each year studied, it is fair to speculate that peak employing periods could have changed over the years.

With regard to the location of the positions (Table 2) reported in the ads, 1974 was notable for the proportion of jobs advertised from outside NSW (11, 35.5%). Five (16.1%) of those advertised outside NSW were in the now non-existent College of Advanced Education (CAE) sector, which from the late 1980s became part of the university sector. Some CAEs joined with existing universities and some became universities in their own right.

Table 2: Total numbers and Location							
LOCATION	Sydney		NSW Regional		Outside NSW		Totals
	No.	%	No.	%	No.	%	
2004	31	81.6	6	15.8	1	2.6	38
1994	39	97.5	1	2.5	-	-	40
1984	19	73.1	6	23.1	1	3.8	26
1974	16	51.6	4	12.9	11	35.5	31
Totals	105	77.8	17	12.6	13	9.6	135

Employers

An interesting picture emerges when types of employers are considered (Table 3). The most striking change has been in advertised positions in academic libraries (including CAEs) which in 1974 comprised more than half (17, 54.8%) of the positions. In 2004, there were only three (7.9%) academic library positions over the four weeks studied. The increase in the number of teacher librarian positions is difficult to explain. While the NSW Government gave public schools the option of advertising positions as opposed to the previous practice of "service transfers" in 1993 /94 [30], the growth in advertised school library positions for the period studied was in the private school or Catholic sector which have always been able to advertise. Prior to 1994, the Catholic sector did not seem to advertise in the *SMH*. When corporate and government special libraries are considered together, there is a marked increase in positions within the snapshot periods with 1984 recording the highest incidence.

Table 3: Employer type													
	Schools		Local govt		Academic		Special - Government		Special -Corporate		Not stated[i]		Totals
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
2004	10	26.3	9	23.7	3	7.9	6	15.8	8	21.0	2	5.3	38
1994	10	25.0	4	10.0	8	20.0	5	12.5	11	27.5	2	5.0	40
1984	1	3.9	8	30.8	3	11.5	3	11.5	10	38.5	1	3.9	26
1974	1	3.2	8	25.8	17	54.8	1	3.2	4	12.9	-	-	31
Totals	22	16.3	29	21.48	31	23.0	15	11.1	33	24.4	5	3.7	135

[i] Usually positions advertised through employment/recruitment agencies.

Qualifications

The qualifications required to practice as a librarian have changed over time. In 1974, to work as a librarian one needed to hold either a Library Association of Australia (LAA)[3] recognised qualification or have the LAA Registration, the Librarianship Certificate Course from Sydney Technical College (pre-1976) or the Associate Diploma in Librarianship from RMIT (commenced in 1970). From January 1994, people joining the Australian Library and

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[3] Library Association of Australia (LAA) is the previous name for the Australian Library and Information Association (ALIA).

Information Association (ALIA) or seeking recognition as a librarian with any of these three qualifications were also required to hold at least an undergraduate degree [31]. Accordingly our data refers to a multitude of qualifications that we have categorised as per Table 4. The data clearly show that fewer job ads are requiring the professional qualification of the day, with only 32.5% of the ads in 2004 requiring ALIA recognition whereas in 1974 74.2% of ads mentioned ALIA recognition as a requirement. Further, more ads are not specifying a qualification, and there appears to be the beginning of a tendency to "broadband" positions – that is to advertise positions for qualified librarians, library technicians, or people with library experience.

Table 4: Qualifications														
	Professional Library Qualification or eligible for LAA/ALIA recognition		No qualification specified		Only specifies some sort of "Tertiary qualification"		Library Technician (or Assistant) or Librarian or no qualifications depending on years and experience.		In process of completing library qualifications		Library or tertiary qualifications only desirable not mandatory		Dual Teacher and Librarian		Total
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.
2004	13	32.5	18	47.4	2	5.3	4	10.5	-	0.0	1	2.6	-	0.0	38
1994	16	40.0	15	37.5	4	10.0	1	2.5	2	5.0	1	2.5	1	2.5	40
1984	16	61.5	7	26.9	1	3.8	-	0.0	-	0.0	2	7.7	-	0.0	26
1974	23	74.2	7	22.6	-	0.0	-	0.0	1	3.2	-	0.0	-	0.0	31
Totals	68	50.4	47	34.8	7	5.2	5	3.7	3	2.2	4	3.0	1	0.7	135

Experience

The number of job ads specifying that experience is required has increased and then leveled out over the period studied (Table 5). The very small number of ads explicitly stating the positions are suitable for entry-level staff and the large number of positions requiring either generalist or management experience for the periods of 1994 (87.5%) and 2004 (84.2%) makes it hard to understand how new graduates would find any work at all. However, while employers may be asking for experience in particular areas, it is recognised that they might not always be able to find it.

Table 5: Experience											
EXPERIENCE REQUIRED	Yes		No		Management experience		Not stated		Desirable.		Total no
	No.	%	No.	%	No.	%	No.	%	No.	%	No.
No. 2004	28	73.7	2	5.3	4	10.5	4	10.5	-	0.0	38
No. 1994	30	75.0	1	2.5	5	12.5	4	10.0	-	0.0	40
No. 1984	14	53.9	-		3	11.5	8	30.8	1	3.9	26
No. 1974	18	58.1	1	3.2	-	-	9	29.0	3	9.7	31
Totals	90	66.7	4	3.0	12	8.9	25	18.5	4	3.0	135

Nature of work

In Australian society in general there has been a significant increase in the extent of part-time, fixed term contract, and casual work over recent decades. While for some people work of this nature provides flexibility to balance work, family and study, for others it adversely affects security and financial stability [32]. This study (Table 6) reflects a decrease then a slight increase in 2004 from 1994, in permanent full time work but, like an earlier study [33], shows little or no increase in casualisation in the LIS workforce. This is despite anecdotal evidence to the contrary. A disadvantage of using job ads as a source of data is that advertising costs money and takes time, and it is possible that lower level and casual jobs are often filled through informal networks rather than formal job ads.

NATURE OF WORK	Permanent Full time		Permanent part time		Temporary/contract full time		Temporary/contract part time		Casual		Not stated or implied.		Total ads
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.
No. 2004	25	65.8	7	18.4	3	7.9	-	-	1	2.6	2	5.3	38
No. 1994	21	52.5	8	20.0	11	27.5	-	-	-	-	-	-	40
No. 1984	19	73.1	1	3.9	3	11.5	2	7.7	-	-	-	-	26
No. 1974	31	100	-	-	-	-	-	-	-	-	-	-	31
TOTALS	97		16		17		2		1		2		135

Table 6: Nature of work

Job skills profile

Job skills are categorised into four profiles (Table 7). These were loosely based on previous work by Moore [7] and Brittain [12]. While "established skills" refer to skills traditionally used in libraries or by librarians, the positions may not have library or librarian in the job title. We have been informed in setting this category, by changes in the profession. For example, where "automation" may have been included in "established skills" in 1984, equally Internet searching or knowledge of digital or electronic libraries would be included in "established skills" for 2004. "Applied information skills" refers to work that may or may not require formal LIS or information management (IM) qualifications, but does require the skills that would be learned while acquiring those qualifications. The types of positions included in this category include information officers, photo librarians, and indexers. Work "requiring some other special skills" is comprised of positions that may or may not require LIS or IM qualifications but also require additional skills, qualifications or knowledge to that usually perceived to be in the domain of librarians. Work in this category would include information officers and researchers requiring specific subject domain knowledge and skills, and web based work requiring programming languages or specific hardware or software knowledge.

The final category is that of Teacher Librarian or School Librarian. A qualified teacher librarian is a person who holds both recognised teaching and librarianship qualifications [34].

It is interesting that the percentage of work requiring "established skills" over the period has decreased from 100% (1974) to less than 50% (2004) of the positions advertised. Some of this is represented by the growth in teacher librarian positions, but also there has been an increase in work requiring applied information skills, or some other special skills.

Table 7: Job skills profile									
	Established skills		Applied information skills		Requiring some other special skills		Requiring teaching qualification		
	No.	%	No.	%	No.	%	No.	%	No.
2004	17	44.7	7	18.4	4	10.5	10	26.3	38
1994	23	57.5	6	15.0	-	-	11	27.0	40
1984	19	73.1	5	19.2	2	7.6	-	-	26
1974	31	100.0	-	-	-	-	-	-	31
Totals	90	66.7	18	13.0	6	4.4	21	15.6	135

Categorisation frequencies

The number of cases in which a dictionary category occurred were counted (Table 8)[4] and then ranked by occurrences for 2004. The number of cases within which each term appears reveals that ads in 1974 were simpler, usually stating that a particular type of librarian (e.g. reference or technical services) was required and giving instructions on how to apply. By 2004, a wider range of categories were required which may indicate applicants needed a broader range of skills, characteristics and competencies for particular jobs. It may also point to the increasing requirement for transparency in recruitment and appointment procedures which require that details of the selection criteria are clear.

With regard to particular jobs skill categories, not surprisingly, **Web design and maintenance** and (more surprisingly) **E-resources** were not required for any jobs in 1994 and yet were required for 18 (47.4%) and 9 (23.7%) of the jobs respectively in 2004. So with the introduction of the Internet and electronic media, librarians' jobs have undergone rapid change within the space of 10 years. Other interesting trends are the increase in importance of **Interpersonal skills** from being a requirement in 7 (22.6%) jobs in 1974 to 26 (68.4%) jobs in 2004. Similarly, **Behavioural skills** are seen as increasingly important, required in five (16.1%) jobs in 1974 and 24 (63.2%) in 2004. Other rises are seen for **Client services** with

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[4] The 18 categories in Table 8 are bolded within the table and throughout the text.

five jobs in 1974 (16.1%) rising to 14 jobs (36.8%) in 2004) and **Management** with six jobs (19.4%) in 1974 to 15 (39.5%) in 2004.

Equally interesting is the decline in the number of ads seeking **Technical services** skills from 19 (61.3%) jobs in 1974 to 10 (26.3%) in 2004 and the decline and then partial rejuvenation of **Reference services** from 20 (64.5%) jobs in 1974, down to 9 in 1984 (34.6%) and back up to 15 (39.5 %) in 2004.

Also of interest is the low number of positions throughout the years that call for the categories of skills we have labeled **Information services**, which includes reader education, information literacy, user training and education, areas widely reported in the LIS literature as key and growing areas

Table 8: number of ads in which dictionary categories appeared (ranked by the 2004 frequency)								
	1974		1984		1994		2004	
	No.	%	No.	%	No.	%	No.	%
Interpersonal skills	7	22.6	6	23.1	21	52.5	26	68.4
Behavioural characteristics	5	16.1	3	11.5	10	25.0	24	63.2
Web design and maintenance	-	-	-	-	-	-	18	47.4
Environment	-	-	1	03.9	9	22.5	15	39.5
Management	6	19.4	4	15.4	12	30.0	15	39.5
Reference service	20	64.5	9	34.6	13	32.5	15	39.5
Client services	5	16.1	2	07.6	6	15.0	14	36.8
Common workplace requirements	-	-	5	19.2	7	17.5	12	31.6
Technical services	19	61.3	8	30.8	9	22.5	10	26.3
E-resources	-	-	1	03.9	-	-	9	23.7
Generic skills	-	-	1	03.9	6	15.0	8	21.1
Generic IT Skills	-	-	-	-	2	05.0	5	13.2
Archives & records management	-	-	2	07.7	2	05.0	4	10.5
Hardware	-	-	1	03.9	1	02.5	3	07.9
Integrated library systems	-	-	5	19.2	5	12.5	3	7.9
Information services	3	09.7	1	03.9	1	02.5	2	05.3
Programming languages	-	-	-	-	-	-	1	02.6
Knowledge management	-	-	-	-	1	02.5	-	-

<u>Cluster analysis and multidimensional scaling</u>

Cluster analysis is based on the pattern similarity (correlations) of the 18 categories in the dictionary. One output of a cluster analysis is a dendrogram, which graphically displays the clustering process. The hierarchical agglomerative clustering approach used in this research begins by joining two terms with the most similar patterns according to the distance criterion. Subsequent terms are joined into existing clusters and the clusters are combined until one large cluster encompasses the entire set of terms. For the 1974 data, the most informative picture emerged at the four-cluster level. The dendrogram comprises three clusters of two terms and a single member cluster (**Management** as an isolate) revealing less similarity to the other terms. Interestingly only seven of the 18 categories from the dictionary are represented in the 1974 ads (Figure 1).
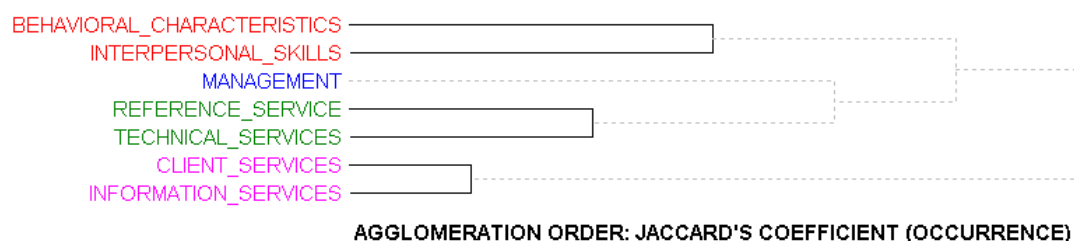

Figure 1: 1974 Cluster analysis

MDS uses the same similarity (correlation) matrix as a cluster analysis to study the underlying structure of the data. Often used jointly with cluster analysis, MDS produces a two- or three-dimensional graph or "map" in which the co-occurrence patterns of the terms are represented visually. Thus, two terms with similar co-occurrence patterns are represented as lying close to each other, while terms with dissimilar patterns are placed far from each other. The optimal MDS solution for the 1974 data is a two dimensional map (Figure 2) (RSQ=.86, Stress=.19)[5].   The horizontal (X) axis represents a continuum from interpersonal skills and behavioural characteristics on the left to technical services and information services on the right, while the vertical (Y) axis shows an interesting continuum from management to client services. There are no centrally located categories, with categories appearing in different quadrants indicating that in 1974 the categories are separate and well defined.

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[5] As already mentioned RSQ is the amount of variance explained by the solution, and stress is the amount of distortion of the data required to fit the solution.
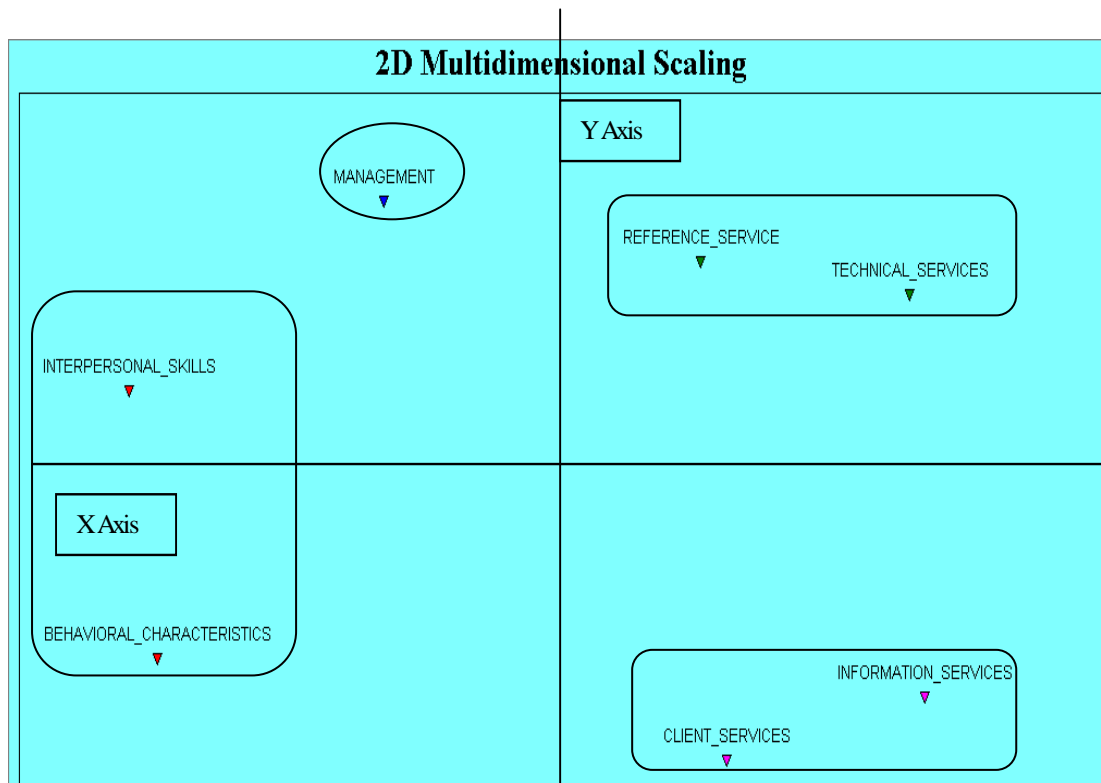
Figure 2: MDS Map of 1974 data (RSQ=.86, Stress=.19)

It was difficult to provide a cluster analysis for the 1984 and 1994 data. There was no point where clear and rational clusters emerged. As the number of clusters was increased, the data moved from one clump to isolates, without much pairing and grouping of categories. Where pairing and grouping did occur it was with such categories as **Client service**s and **Generic skills**. One interesting cluster that emerged in the 1984 data was **Integrated library systems** with **Technical services**, which while possibly not rational today, may have been rational in 1984, when library systems were most usually automated catalogues. Similarly, in the 1994 data **Technical services** and **Reference services**, moved back together to form an early rational cluster, as did **Integrated library systems** and **Hardware**. Similarly the MDS for 1984 and 1994 produced a jumbled picture, with related terms appearing across the axes with low RSQ and high stress.

The 2004 ads, in addition to containing more terms also contained more words and were more complex overall. By 2004 (Figure 3) at an optimal seven clusters there were two pairs, **Generic Skills** and **Common workplace requirements** and **Integrated library systems** and **Information Services**. P**rogramming languages**, **Archives and records management**, **Generic IT skills** and **Hardware** were isolates. The remaining terms form a large cluster.
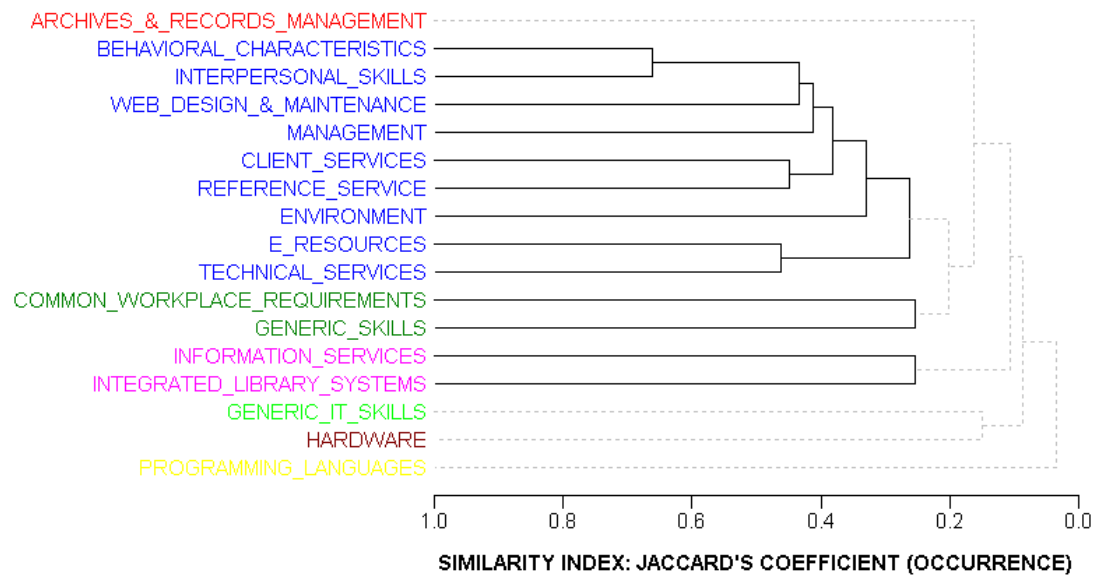
Figure 3: 2004 cluster analysis.

The optimal MDS solution for the 2004 data is a three-dimensional map (RSQ=0.87, stress=0.20), but as three-dimensional maps are difficult to represent adequately on the printed page, Figure 4 displays only the first two axes that also explain the greatest variance. The horizontal axis represents a continuum from **Programming languages** and **Integrated library systems** to **Reference services**, **Clients services** and **Environment**. The vertical axis displays a similar continuum from **Archives and records management** to **Generic IT skills** and **Hardware**. In general, to the left of the map appear categories related to computer skills and technical services (with the interesting exception of **Information Services**) while on the right are the skills and competencies related to public service (with the interesting exception of **Hardware**).
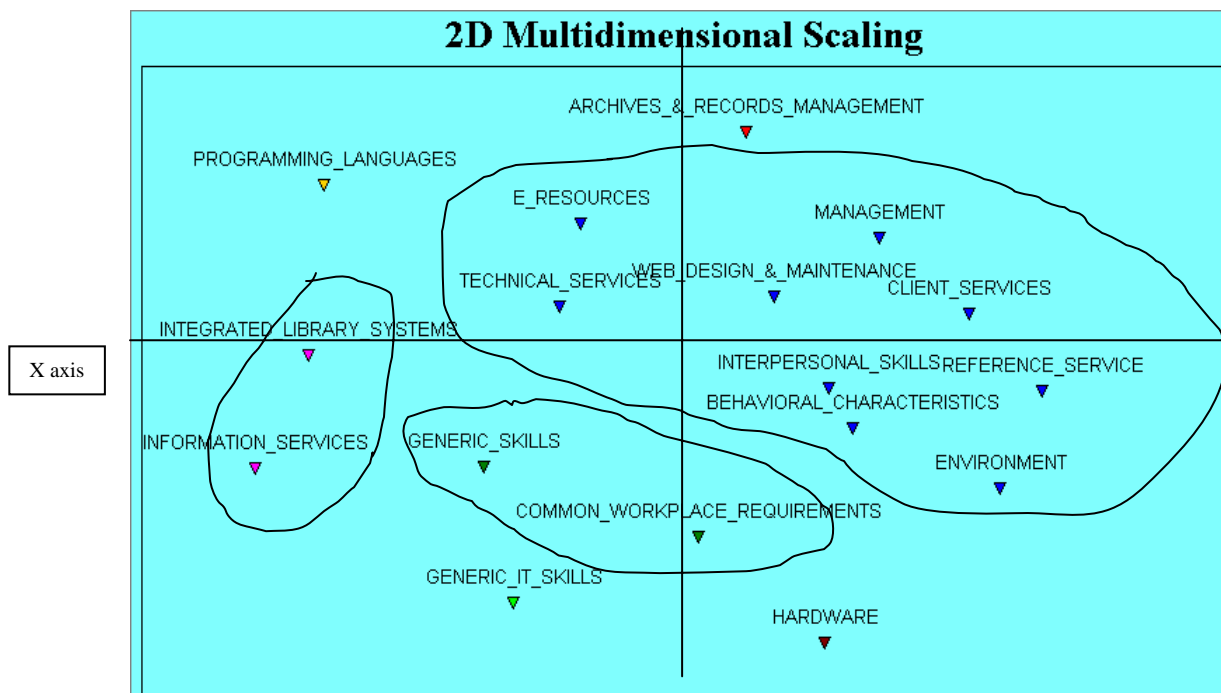
2D Multidimensional Scaling

ARCHIVES_&_RECORDS_MANAGEMENT

PROGRAMMING_LANGUAGES

E_RESOURCES

MANAGEMENT

WEB_DESIGN_&_MAINTENANCE

TECHNICAL_SERVICES

CLIENT_SERVICES

INTEGRATED_LIBRARY_SYSTEMS

X axis

INTERPERSONAL_SKILLS REFERENCE_SERVICE

BEHAVIORAL_CHARACTERISTICS

INFORMATION_SERVICES

GENERIC_SKILLS

ENVIRONMENT

COMMON_WORKPLACE_REQUIREMENTS

GENERIC_IT_SKILLS

HARDWARE

Figure 4: MDS Map of 2004 data (RSQ=0.87, stress=0.20)

Discussion

It is recognised that job ads cannot express all of the requirements an employer may have of a potential employee, sometimes they may indeed express more general legislative requirements; nonetheless, job ads are the most available and public expression of those requirements. While the content of ads does not identify the actual characteristics of the individuals hired, the content does provide a picture of desired characteristics and also throws light on developments in the field of practice [19]. Thus the ads provide only a starting point for research into the current and future roles of librarians.

The job ads themselves have changed, from 1974 where brief simple ads assumed we knew what it meant to be a librarian, to long, wordy ads for often highly specialised information related jobs in 2004. As mentioned previously this seems to indicate that librarians are required to have a broader range of skills, for example a working knowledge of a range of technologies. It also seems to be an artefact of organisational and legislative requirements for transparency in recruitment and appointment procedures. On the face of it the more detailed later ads contribute to a greater richness for this kind of research. They also provide more information for both job seekers and other employers.

The anecdotal evidence suggesting a decline in the number of positions for librarians and information professionals is not supported by the data. Nor does the data support similar anecdotal evidence of a decline in special library positions (although there appears to be a

sharp rise in corporate library positions in 1984 and 1994 followed by a small drop in 2004). What the data does appear to indicate is that employment in public libraries has remained fairly stable over the period studied, unlike ads for employment of librarians by schools which has risen and by academic libraries where there is a sharp decline in positions advertised. While the closures or mergers of CAEs may explain some of the academic library job ads decline in the 1980s, other possibilities should be considered. For example, does this indicate extremely low turnover of staff and the "greying" phenomenon or are other explanations more likely? Does the increasing reliance on electronic media mean that academic libraries may be employing staff with qualifications in areas other than librarianship, for example computing, information technology and information systems? Are there indications that we are beginning to see a composite information professional with a wider variety of skills, including those in information management?

The data also reflects a lack of uniformity in LIS qualifications required for those seeking to enter the LIS field at the professional level and an increasing lack of reference to specific qualifications. Other studies have discussed the increasing invisibility of LIS courses as schools merge with other disciplines. Further, it is difficult to see how new entrants to the profession gain their first job, as the vast majority of ads by 2004 require experience. A person considering a career in LIS who has been scanning the job ads may be encouraged to choose a career where it appears less difficult to gain entry. A quick scan of (2004 and 2005) newspapers reveals job ads specifically addressing new graduates in many other fields, for example accounting, engineering and IT. But a potential LIS worker may see no jobs advertised specifically for beginners in the profession. Further, the jobs that are advertised are increasingly advertised for people with professional, technician or no qualifications, so the incentive to study LIS is removed, as from the ads, it may appear that professional positions may be obtained without professional qualifications.

However, the data confirms both the studies referred to in the reviewed literature and anecdotal evidence that in the period under investigation, the skills, knowledge and competencies required to work as a librarian have evolved, and in some cases changed dramatically. Further, there is a growing lack of clarity about what comprises the established skill set of LIS workers, with the jobs advertised in 1974 all calling for skills and competencies clearly within the LIS domain whereas by 2004 only 44.7% of positions advertised asked for established LIS skills. Technological change (e.g. high incidence of requirements for **Web design and maintenance**, and **E-resources**) has profoundly

influenced the LIS field of employment, as have the **Behavioural characteristics** and **Interpersonal skills** (such as flexibility, creativity, negotiation and communication skills etc.) required to operate in an increasingly technological and changing environment, **Management** skills are increasingly called for. It is interesting also to note that our data does not reflect the reported increase in demand for **Information services**, such as information literacy and bibliographic instruction reported in the literature. We are unclear on why this is so.

Thus, many of the skills and characteristics reflected in the job ads for the LIS profession, have not been explicitly claimed as established LIS skills, nor can they be. Sometimes ads look for librarians with these skills, sometimes ads look for people with these skills, irrespective of whether they are a librarian or not and whether or not the place of employment is a library.

These factors lead us to speculate about the nature of the LIS profession. An accepted body of knowledge coupled with a system of certifying that individuals have mastered that body of knowledge before they are able to practice are two of the key elements comprising a profession [35]. While librarianship is not the only profession grappling with dramatic changes brought about by technology and the resultant workplace change, librarianship is one of the few professions suffering the appearance of a decline, and a great deal of questioning from within as well as externally about the ongoing need for, or viability of, the profession. This is despite that in today's information rich society, the LIS skills and competencies of organising and managing information, and providing people with the information they need when and where they require it have never more been necessary.

The use of cluster analysis and MDS techniques, not commonly used in investigations of job ads, was intended to expose the underlying structure of the job market. However for 1984 and 1994 it failed to reveal any meaningful co-occurrence profiles for any of the category terms. No clusters or maps emerged that exposed what may have been seen as a core set of categories of skills and competencies for those periods. This may reflect how volatile and fast changing the workplace was during those periods rather than a failure of the approach. The small data set makes it difficult to draw conclusions about the method. Analysis of a larger dataset would enable further testing of the value of this approach in understanding job ads.

Further research

This research was conducted with a very small data set. At the outset of the study information was received that the period within which most positions in the LIS field were advertised is from July to September [36], so the 2004 data was gathered over this period for another research project, and then the other years for comparison. However, the time most jobs are advertised during the calendar year could have changed. Anecdotal evidence suggests that in the 1970s, the period most job ads appeared was from December to March as new graduates came onto the market. Should resources be available, it would be very interesting to analyse job ads for a longer length of time in each time period.

With regard to the perceived drop in positions in academic libraries, it would be interesting to conduct analyses using other available sets of data, to see whether the overall numbers employed in the sector have fallen.

It would also be useful to survey employers and practicing librarians, to see if their experiences confirm the findings of this study and to compare the different visions of our field developing in practice. We will also be seeking to inform our findings from the broader literature defining professions and selection and recruitment.

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