

# Digital Curation in the Academic Library Job Market

**Jeonghyun Kim**  
College of Information  
University of North Texas  
Denton, TX  
Jeonghyun.Kim@unt.edu

**Edward Warga**  
College of Information  
University of North Texas  
Denton, TX  
Edward.Warga@unt.edu

**William Moen**  
College of Information  
University of North Texas  
Denton, TX  
William.Moen@unt.edu

## ABSTRACT

With the increasingly important role librarians play in the fast-paced and data-intensive digital curation environment, there is a need to identify the qualifications and responsibilities expected by employers. An investigation of 110 recent job advertisements was conducted to identify competencies required of individuals working in the digital curation field. The job ads analysis serves as an important indicator of the emerging requirements for a qualified workforce in the field of digital curation in the academic library job market.

## Keywords

Digital curation, job advertisements, academic libraries, content analysis

## INTRODUCTION

The term ‘digital curation’ was first used in 2001 as a title for a seminar on digital archives, libraries, and eScience to highlight curation activities that can be carried out on a broad range of scientific data and resources in multiple disciplines. Since then it has evolved to the point where it is now generally accepted to indicate “the active management of digital information over its entire life cycle for both current and future use” (Pennock, 2007). Other definitions emphasize the aspect of adding value through the data curation process: “Digital curation involves maintaining, preserving and adding value to digital research data throughout its lifecycle” (Digital Curation Centre, n.d.). The field of digital curation, which intersects with a variety of broader topics, is evolving rapidly presenting academic libraries with new challenges and exciting opportunities. There is an unsettledness to the terminology related to the digital curation arena. Terms such as digital curator, data librarian, data scientist, data manager and eScience professionals are used to describe various roles for professionals in this arena.

Several major research funders, including the National Science Foundation (NSF) and the National Institutes for

Health (NIH), require data management and/or sharing plans at the grant application stage. A recent National Science Board (NSB) (2011) report reflects an ongoing effort to refine NSF data policies and includes a statement of principles related to data sharing and management. This report, in turn, is built upon previous thinking and reports of various U.S. and international organizations.

Reports, such as the one by the National Science and Technology Council (2009), suggest the need for collaboration among organizations, entities, and individuals to carry out data management and data curation responsibilities. In the context of academic libraries, Swan and Brown (2008) discussed three main potential roles: increasing data awareness among researchers; providing archiving and preservation services for data within the institution through institutional repositories; and developing a new professional practice in the form of data librarianship. Walters and Skinner (2011) also highlighted a need for collaboration with other administrative units, such as information technology, and academic units and domain researchers to play such potential roles.

However, a report published by the Association of Research Libraries (Soehner, Steeves, & Ward, 2010) indicated gaps in academic libraries in terms of appropriately trained information professionals able to act on opportunities for supporting cyberscholarship. Some recent articles assert the need to educate and train library staff if libraries are to succeed in the areas of digital curation and data management (e.g., Ogburn, 2010; Heidorn, 2011). The NSB report, as well as earlier NSF reports, has highlighted workforce development needs in the context of the current and future challenges presented by all the data issues.

Within this context, identifying and articulating the specific competencies, i.e., the knowledge, skills, and abilities, required to perform a series of digital curation functions is an excellent basis for developing and tailoring training and educational programs to meet specific objectives. This study of job advertisements for academic library positions is one activity of a current capacity building project, Information: Curate, Archive, Manage, Preserve (iCAMP). In this project, we are developing a four-course masters level curriculum for digital curation and data management. It deploys a competency-based curriculum approach (Moen, Kim, Warga, Wakefield, & Halbert, 2011). This analysis of

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job advertisements was carried out to identify and define knowledge, skills, and abilities as a part of the competency development process.

## **BACKGROUND**

Libraries are at a critical point due to dramatic and rapid technological advances and the incredible increase of digital information – either born digital or created via mass digitization. Digital libraries and digital repositories are the focus of many libraries, especially academic and research libraries. Following such trends, the changing roles of and competencies needed by librarians who work with digital content are widely discussed in both scholarly and professional literature (e.g., Allard, Mack, & Feltner-Reichert, 2005; Walters, 2007; Williams, 2009). Choi and Rasmussen (2009), in their study on job advertisements for digital library positions posted in College and Research Libraries News from 1999 to 2007, verified shifts in staffing needs and the required qualifications for personnel working with digitally-focused collections, services, and technology applications in academic libraries.

As digital curation has emerged as a new field, the need for professionals who are competent in the field has risen with the number of positions concerned with digital curation. Tibbo, Hank, and Lee's (2008) survey supports this: 69% of the survey respondents report that a digital curation job was posted at their institution no less than a year ago. As an example of such a position, Penn State University Libraries described its newly defined role of Digital Collection Curator as, "Lead development of an inclusive, user-focused agenda for digital scholarly content stewardship; investigate, recommend, and develop plans for user-focused and repository-based services to effectively manage the sustainable creation, collection and distribution of high-value digital scholarly content; and manage a broad set of existing digital collections and repository content" (Choudhury, Furlough, & Ray, 2009).

As more attention is paid to the role of libraries in data curation, several studies have attempted to analyze emerging job characteristics. Cragin and her colleagues (2009) examined data curation job postings to investigate the needed educational background and skills for data curation and characterize the data curation employment landscape. Kim, Addom, and Stanton (2011) conducted interviews and focus groups to collect the job requirements of eScience professionals who solve large-scale information management problems for researchers and engineers. The iCAMP study presented here is contributing to the community's understanding of what competencies need to be addressed in training and educational programs.

## **METHODOLOGY**

Job advertisements act as relatively accessible indicators of the competencies required by employers in a field. To collect current academic library job advertisements in the field of digital curation, we monitored several online sources and searched for advertised position postings. Sources monitored included ALA JobLIST, ARL's Job

Announcements, LIS Jobs, and Digital Curation Exchange Jobs that cover all regions of the United States and Canada. Primary search terms used to locate relevant job advertisements included any derivative terms for curate, preserve, archive, and manage – e.g., curation, curator, preservation, archiving, archivist, management, manager, etc. A second set of terms was then used in combination with the primary terms to narrow search results; those terms included data, information, digital content, digital object, digital asset, digital information, digital collection, digital data, research data, and scientific data. This paper reports the results from analyzing data from job advertisements for positions in academic libraries only.

An initial set of 110 job advertisements, collected between October 2011 and March 2012, comprised the corpus for this analysis. Data were entered into NVivo qualitative analysis software, and content analysis coding techniques were used. We categorized data into five dimensions: position title, institution, degree, experience, and skills and knowledge, and then determined frequencies and patterns of occurrence of specific job characteristics and requirements.

## **RESULTS**

### **Position Title**

The position title had many variations. The term "librarian" occurred most often (67 out of 110), followed by "digital" (62), "data" (24), and "archivist" (15).

Only 12% of positions (13) had administrator titles, such as head of digital projects, associate director of digital initiatives, director of special collections, digital library content manager, etc.

### **Institution**

The job advertisements included in this study originated from institutions in the United States and Canada. Academic libraries in 34 states were represented with institutions in Massachusetts posting the highest number of job advertisements (9 out of 110), followed by Indiana (8), Michigan (7), California (7), Texas (6), New York (6), and Georgia (6).

### **Degree**

Of the 110 job advertisements collected, 85% (93 out of 110) required or preferred an ALA-accredited Master's degree as an educational qualification for the job.

Twenty-eight percent of job ads (31) referenced the requirement or preference for a Master's degree in other disciplines in addition to, or instead of, a degree in LIS. Among them, 9 positions preferred or required an undergraduate and/or advanced degree in a science or engineering discipline; 6 in the arts and humanities; and 5 in the social sciences.

Eleven ads did not specify a particular discipline; most labeled it as "related or relevant advanced degree," but three ads included the more encompassing phrase, "relevant data-intensive discipline."

## Experience

About 66% of the job ads (73 out of 110 ads) expected applicants to have certain work experiences, which were often described broadly as experiences working in a library or archive setting. Some job ads described specific work experiences: 18 ads preferred individuals with experience in acquisition, curation, preservation, and management of digital content or collections; 9 specified some experience working with research data; 6 required experience with an institutional repository; and 3 indicated experience with digital library technology, standards, and practices.

Fifty-eight percent of job ads (64) required a specific number of years of work experience: 13 required at least one year; 27 a minimum of two years; and 20 a minimum of three years. Two administrative positions required at least eight years of relevant professional experience. The average number of years of preferred or required work experience was 2.70.

## Skills and Knowledge

Based on the required and preferred qualifications found in the job announcements, areas of knowledge and skills expected for professionals in digital curation were categorized into twelve areas (see Table 1).

Among preferred or desired qualifications stated in the ads, an ability to work in an information technology intensive environment appeared most frequently (58%; 64 out of 110). This includes knowledge of multiple operating systems and web architectures including Unix/Linux, Windows, and LAMP; programming and scripting, such as Java, PHP, and Perl; and web development skills, such as HTML and CSS. Another facet of this area includes the ability to work with data using relational databases, such as Oracle or MySQL; data analysis tools, like NVivo, Stata, SAS, and SPSS; and specifications including SQL, XML, XSLT, RDF, and OWL.

The technical, organizational, and procedural standards and specifications area was reflected in 55% of job ads (60). Among them, familiarity with and knowledge of various metadata standards, such as MARC, Dublin Core, METS, MODS, and PREMIS, were mentioned in 51 job ads. Knowledge of the tools and applications used in curating digital data was required in 35 job ads. Among those ads, 19 job ads specifically mentioned knowledge of commonly used repository platforms including, but not limited to, DSpace, Eprints, and Fedora.

About a quarter of job ads (27) described functional skills for curation. Functional skills include methods, techniques, practices, and procedures for various curation activities, including selection, creation, and preservation. A similar number of job ads noted working knowledge of curation. Working knowledge includes concepts, issues, and technical challenges of various subjects. Those subjects include data management principles, intellectual property issues, repository architecture, and relevant academic/research policies.

Areas	No. of Job Ads	Percent
Working in an Information Technology Intensive Environment	64	58%
Standards and Specifications	60	55%
Project Management	49	45%
Personal and Interpersonal Skills	47	43%
Research and Trends	41	37%
Tools and Applications	35	32%
Liaison and Support	34	31%
Functional Skills for Curation	27	25%
Working Knowledge for Curation	25	23%
General Library/Archive Skills	24	22%
Professional Development	17	15%
Other Domain Knowledge	4	4%

**Table 1. Areas of skills and knowledge**

Job ads in the field of digital curation also highlighted that project management skills are increasingly in demand. Project management, which refers to qualifications related to planning, coordinating, and implementing effective projects including supervising other staff members, was mentioned in 49 job ads. Professionals in the digital curation field also need to keep up with emerging trends of digital scholarship, including electronic publishing, digital preservation, and data mining, as reflected in the research and trends area represented in 41 job ads.

Forty-three percent of job ads (47) expected applicants to have personal, transferable skills, and essential work skills that are important to be a 'good professional.' Such skills can be applicable to any field in libraries and are reflected in phrases such as excellent communication skills, strong analytical skills, multi-tasking ability, independent judgment, leadership, and so forth.

## DISCUSSION

The iCAMP job advertisement analysis provides a current snapshot of the competencies and qualifications required or desired for professionals within the emerging field of digital curation. We found the level of detail in the advertisements quite variable in terms of job qualifications and responsibilities. The variability may be yet another reflection of this still-developing field and the unsettledness of who will assume responsibilities for the broad range of challenges this new digital curation and data management field presents.

The appearance of required domain knowledge in a specialized academic discipline including science, engineering, and history indicates that professionals in the field require certain domain knowledge depending on the types of resources or data being managed. This is also supported by the requirement or preference for master's degrees in fields other than library and information science.

The significant reference to skills for working in an information technology intensive environment as well as specific tools and applications for digital curation is aligned with Tibbo, Hank, and Lee's (2008) survey study that found

both practical skills and technical skills are important competencies considered when evaluating digital curation job applicants.

Liaison and instruction skills are also mentioned in the ads, which indicate that these professionals often provide specialized research consultations and reference services for faculty and students as well as develop outreach activities to promote resources and services in assigned subject areas.

## CONCLUSION

This paper distills information found in a set of advertisements for positions within academic libraries. We are continuing the collection of job ads in the digital curation and data management field. Subsequent analyses will be expanded to include digital curation jobs in other types of institutions. Sharing the results of our analyses may assist employers as they articulate job position descriptions as well as others developing educational and training programs in digital curation.

As this analysis of job ads continues, we will refine our understanding of the competencies required in this field. This knowledge will be used to tailor the curriculum developed by the iCAMP project to prepare students with the competencies required by qualified professionals in the field of digital curation and data management.

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