

Survey of Library Services at *Engineering News Record's* Top 500 Design Firms: Ten years later

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Abstract

In October 2004 a survey was mailed to the *Engineering News Record's* Top 500 Design firms asking about their information resources and whether there was a degreed librarian on staff. The article resulting from this research (Napp 2004) has been widely cited in the literature in the past decade. In light of the economic crisis in the United States during the decade since 2004, it was decided that a follow up survey to learn what had changed would be useful.

The goal of both surveys was to assess the state of library services in US design firms. The 2004 and the 2014 surveys were mailed to the most current *Engineering News Record's* Top 500 Design firms mailing list available.

Findings from the current survey help illuminate the information landscape into which engineering students enter after graduation. These findings can and should help inform current information literacy practices of academic engineering librarians.

Introduction

Academic engineering librarians play a role in preparing engineering students for careers that will primarily be outside of academe. The current study found most US engineering firms lack

the variety of databases and other electronic resources our students are taught to use. Also most firms do not employ a degreed librarian. Understanding the work environment graduates will join can assist librarians in better preparing them for their careers. Engineers need to know how to locate and use information on their own. While they are students and have access to librarians who can guide them is the ideal time to become information literate. Showing how information seeking is part of the design process will help students see its relevance to their future career.

The survey instrument was in two parts with the first part to be completed by a principal in the firm and the second part by the librarian, if the firm employed one. Librarians were asked if they have a master's degree and whether it was a requirement for their job, what databases they use and the types of information they are asked to find, and if they serve more than one office and if these offices were within one state, multi-state, or multi-national.

Literature Review

At the time of the 2004 survey there was not much literature investigating libraries and librarians in engineering firms. In the decade since there has been more literature on corporate engineering libraries.

Chaudhry and Al-Mahmud (2011) surveyed 70 Kuwaiti engineers about their information finding and management behaviors. Participants responded that they used sources such as websites, institutional repositories, colleagues and professional forums. Academic and other specialized databases were deemed the most trustworthy by most engineers responding.

Jeffries and Lafferty (2012) surveyed engineering students working as co-ops (a co-op is a paid work experience in the students' field of study. Oftentimes the student works full-time for a semester). The students were asked about job-related information seeking and comfort level with

accessing engineering literature. The authors found that all the co-ops were expected to find information by their employers. Unfortunately, the types of information the students frequently had been taught to use were not necessarily what was needed for their work assignment.

Waters, Kasuto and McNaughton (2012) were two academic librarians and a librarian working in a firm who formed a partnership to learn which information literacy skills were most useful for engineering graduates entering the workforce. Knowing how to find gray literature and how to evaluate information in general were deemed most useful.

Talikka, Eskelinen and Värri (2014) looked at the impact of information literacy on undergraduate research skills. The authors found that students who learned how to perform a literature search were more likely to include citations from diverse viewpoints and sources than students without information literacy skills.

Gadd, Baldwin and Norris (2010) looked at 47 capstone project reports and found a positive correlation between the literature review grade and the overall grade. The authors also found a somewhat weaker correlation between the number of citations and the overall grade.

Smith (1998) mailed surveys to the library manager or director of 118 libraries in 90 corporations. The selected libraries were listed in the *Subject Directory of Special Libraries and Information Centers*, 17th ed. Under the headings Plastics, Polymers and Polymerization, or Rubber. Questions about changes from 1990-1996 in staff size, budgets and outsourcing, were included in the survey. Almost half of the libraries were outsourcing at least one function. Professional staffs decreased over 8% and non-professional staff decreased by more than 26%.

Methodology

The survey, hard copies of which were mailed to 500 firms, was in two parts (See Appendix). One part of the survey was to be completed by a principal in the firm. The other part was to be completed by the degreed librarian, if the firm employed one. In this study, the term “degree librarian” refers to a person having earned a Masters in Library Science (MLS) or its equivalent. A "principal" is typically an owner of the firm. They have senior management positions putting them in charge of projects as well as having overall knowledge of the management of the firm. Since a principal would likely have more knowledge of the firm as a whole than a junior engineer, it was decided that a principal should complete a survey.

Typically, the minimum qualification for librarian jobs in the United States is the MLS, although some librarians have an additional Masters degree in a subject area. Librarians with dual Masters degrees are usually working in academic libraries.

Engineering executives might be disinclined to complete a lengthy survey about library services therefore it was felt that keeping the survey short, while providing less detail, would result in a higher return rate. Principals were asked eleven questions and librarians were asked seven. Both the principal and librarian survey instruments were limited to the front and back of one sheet. This was the same design used in the 2004 survey.

The idea of an online survey using a service such as Survey Monkey was considered but ultimately rejected. The primary reason an online survey was not used is that the subject firms often did not have publicly available email directories where specific individuals could be contacted. Also it did not seem possible to compare the responses of the librarians and the principals at the same firm with the online survey tools.

As with the 2004 survey, a mailing list was purchased from *Engineering News Record*. This mailing list consists of the most profitable engineering design firms in the United States. It was thought that the most profitable firms would be those most likely to have a library with a Master's degreeed-librarian.

Eighty-two surveys were returned by principals for a response rate of 16.4%. The 2004 survey has a return rate of 21.8%. It is impossible to know with certainty the reasons for non-returns since both surveys were anonymous. Two surveys were returned as "undeliverable as addressed." Twenty librarians responded.

Survey Results

Principals reported firm sizes ranging in size from 130-12,400 employees when asked to report the total number of all employees at all locations. The average size of the firms was 476 employees. The survey asked principals if their firm had a library. The term "library" was not defined allowing principals to define it for themselves. When asked to define what their library contained respondents indicated that some "libraries" consisted mainly of supplier catalogs or regulations related to the work of the firm. Of the principals responding, 69.5% indicated that their firm had a library.

A librarian was employed at 13.4% of the firms responding. One of those librarians had an orientation program for newly hired engineers. The survey found that engineers in the responding firms obtain information in their own in 91.3% of firms without a degreeed librarian. The percentage of librarians serving more than one office location was 70% and an MLS was required for 25% of the librarians responding. The size of the firms employing librarians ranged from 250 to 12,400 employees.

Principals who were not employing a librarian were asked to select their reason for doing so. The choices were “financial”, “because our firm does not need one”, or they could fill-in another reason. The most common reasons listed were “financial” in 44.2% of firms and “no need” in 40% of firms. Other reasons given were that engineers maintained their own resources and they outsourced library resources. A secretary or other employee has the library as part of their duties in 37.6% of the firms. Local public or academic libraries are used by engineers in 21.7% of firms without a degreed librarian.

Of those responding, 25.4% of the principals indicated that they felt newly hired engineers were able to locate information of their own. Interestingly, 45.7% of the responding principals who indicated their firm had no need for a librarian also responded that] newly hired engineers were not able to find needed information on their own.

Principals were asked about the types of information most often needed by engineers (See Figure 1). Of the principals responding, the types of information needed were 92.4% for standards were needed, 63.2% for regulations, 46.8% for journals, 37.9% for laws, and 30.3% for company information. Although the majority of respondents indicated that journals were needed sources of information, no databases were available at 83.5% of firms responding (See Figure 2). Nine firms subscribe to LexisNexis, two subscribe to Compendex and two subscribe to Dialog. The largest firm responding subscribed to 12 databases including LexisNexis, Knovel, Compendex, Science Direct, Business Source EBSCO, IEEE Xplore, SNL, Bloomberg Environment Reporter, HIS Plus, Northern Light, Capital, and IQ, Energy Central. A correlation between firm size and number of databases available was not found. The largest firm did have the most databases but the next largest firm had none.

Discussion

Information literacy is defined by the Association of College & Research Libraries as: "...a set of abilities requiring individuals to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information." (ALA 2000)

The Accreditation Board for Engineering and Technology or ABET is the accrediting body for engineering and engineering technology programs in the US. ABET 2015-2016 Criterion 3 (ABET 2015-16) contains some information literacy-related student outcomes. Especially "(i) a recognition of the need for, and the ability to engage in life-long learning." Students will certainly need information literacy skills in order to engage in learning outside of the classroom after graduation.

As indicated by this survey, principals expect the new engineers they hire to be information literate. It was noted earlier that over one quarter of the principals responding indicated that they felt newly hired engineers were able to locate information of their own. This study also shows that most engineering design firms provide access to limited information resources.

Understanding the information landscape in which newly graduated engineering students will be entering should inform engineering librarians' information literacy instruction practices. Given the lack of access to databases and research assistance, knowing how to effectively and efficiently search Google and when to seek assistance from a local library should be essential parts of the engineering curriculum. It seems useful to note that 70% of the librarians responding serve more than one office, sometimes in multiple states or countries. For engineers looking for help this could be a factor in how available the librarian is for research assistance.

This point is also made by Rodrigues (2001) in an article which explores the expectations employers have for new engineers. The author suggests that, for engineers, the best time to learn information literacy skills is in college. Rodrigues argues that while in college students have access to more information resources than is available at most firms, as this study confirms. While in college, students also have the opportunity to receive instruction in the use of these resources from librarians. After graduation, such instruction will be much more difficult to obtain.

Much work still needs to be done at both the individual college and department level to integrate information literacy into the engineering curriculum. It is critical that librarians and engineering faculty give students the message that information literacy skills are important in the engineering process.

Librarians can work with engineering faculty to develop assignments that are relevant to students while also teaching important information literacy skills. Integrating information literacy into the curriculum in this way also show students how these skills will help them in their careers. This study shows that working engineers often have little or no access to librarians or databases to provide assistance in locating information. Ensuring that engineering students are information literate upon graduation will greatly aid their career success.

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Appendix

This page and the reverse side should be completed
by a Principal in the firm.

1. Does your firm have a library?

Yes No

2. Does your firm have a degreed (Masters of Library Science or equivalent) librarian on-site (someone for whom this is their primary job)?

Yes (If yes, proceed to question 7) No

3. Is the reason you do not have a librarian on-site...

Financial Because our firm does not need one

Other _____

4. If you do not have a librarian on-site, do you outsource library-type research?

Yes No

5. If you do not have a librarian on-site and are not outsourcing those function, how is needed information obtained?

Engineers get what they need on their own

A secretary of other non-engineer has research as part of their work assignment

Local college, university, or public libraries are utilized

6. If you do not have a librarian on-site, is there a catalog or database of research material owned by the firm to assist in locating the materials?

Yes No

7. What type of information is most often needed in your firm? (Check all that apply)

Regulations (OSHA, EPA, or state rules) Standards Laws

Patents or other technical data Journal articles Company information

Other _____

8. What database(s) does your firm subscribe to? (Check all that apply)

Dialog LexisNexis STN Knovel Engineering Village/Compendex

Other _____

9. Do you believe newly hired engineers are able to find needed information without assistance?

Yes No

10. How many employees are at your location (including Principals)?

11. How many employees are in your firm at all locations total (including Principals)?

**This page and the reverse side should be completed by the
librarian.**

1. Do you have an MLS (Master in Library Science) degree or its equivalent?

Yes No

2. Was an MLS required for your current position?

Yes No

3. What database(s) does your firm subscribe to? (Check all that apply)

Dialog LexisNexis STN

Knovel Engineering Village/Compendex

Other _____

4. What type of information are you asked to find most often?

Regulations (EPA or state rules) Standards

Laws/Building Codes Patents or other technical data

Journal articles Company information

Other _____

5. Is most of the research material available to engineers at your firm in electronic or print format?

Electronic Print Both

6. Do you provide services to more than one office? (Check all that apply)

No Yes, to offices in this state

Yes, to offices in multiple states

Yes, to offices in other countries

7. In your position as librarian, indicate the percentage of a typical week devoted to each category:
(must add up to 100%)

Cataloging

Reference

Web searching

Database searching

Administrative responsibilities

Shelving, filing loose-leaf materials

Document delivery

Non-library duties

Other