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Data Management Librarians Role in a Large Interdisciplinary Scientific Grant for PFAS Remediation: Considerations and Recommendations

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Abstract

This article explores the conflicts, disparities, and inequalities experienced by two librarians when collaborating on a federal grant proposal. The authors discuss concerns related to time and salary expectations and the inequities that can occur during faculty and staff collaborations on research grants. The bureaucratic structure and the job classifications of staff at academic institutions in addition to the contract limitations of non-faculty status librarian positions can hinder successful collaborations. The authors also describe data management needs that may occur when working with interdisciplinary research teams and detail the type of work that is included in writing a data management grant. This article concludes with considerations and recommendations for other data librarians who may undertake similar projects with a focus on ways to create parity between faculty and staff collaborators.

Introduction

This paper discusses the experience of two research data management and STEM librarians at a large state university when they were asked to become co-principal investigators in the data management core of a major grant application for an interdisciplinary approach to the remediation of poly- and perfluoroalkyl substances (PFAS or PFOA) contamination in New England. It was the first time these librarians participated in a large-scale grant as CO-PIs. As a result, the difference in status between faculty researchers and staff librarians as CO-PIs highlighted differences in time availability, as well as the gap between the salaries of librarians versus faculty for similar or the same work.

Background

In 2018, the School of Engineering at the University of Connecticut approached two research data librarians about participating in a grant application to fund several research projects and provide proof of concept related to the possible establishment of a National Institute of Environmental Health Sciences (NIEHS) Superfund Center on the topic of the Exposure, Health Effects, Sensing, and the Remediation of PFAS chemicals in Connecticut.

A Superfund site is a site in the United States designated as having environmental contamination with dangerous chemical waste, often as the result of either industrial accidents or the intentional improper disposal of industrial waste into the ground or water (Park and Allaby 2017). The US Resource Conservation and Recovery Act of 1976 and the subsequent Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 established legislation and funding for the remediation of environmental sites contaminated by industry (Porta and Last 2018). These sites came to be known as Superfund sites when designated by the US government for remediation.

The NIEHS Superfund Research Program "funds university-based grants on basic biological, environmental, and engineering processes to find real and practical solutions to exposures to hazardous substances" (NIEHS 2022b). NIEHS Superfund Centers "bring together teams of health and environmental science and engineering researchers to tackle complex problems related to hazardous substances. The centers also include community engagement, research translation, data science, and training components" (NIEHS 2022a). Previously, the data management librarians built a relationship with the School of Engineering by teaching workshops on best practices of research data management to graduate students and new faculty. When the leaders of the Superfund research center grant application learned that data management was a required element of the proposal, they contacted the librarians. For the research data management librarians, this was an opportunity to gain valuable experience working on a grant proposal and provide advanced outreach to the campus research community.

The librarians agreed to participate in the grant application process despite several reservations about the amount of work that would be required if the grant was funded. During the initial planning stage for

the proposal in the summer and fall of 2019, the librarians shared information on best practices for data management with the researchers during several meetings of the entire group of researchers and PIs. In September 2020, the librarians began work on the data management portion of the grant proposal. A team of co-principal investigators formed called the Data Management and Analysis Core (DMAC). This team was led by a faculty member in the School of Business with a strong background in information science, as well as the two librarians. According to the grant proposal, this team worked within the Superfund Center to provide data analysis of the various research projects, provide training, and work with other cores such as Community Engagement to do outreach and publicity on the research findings. The DMAC would also be tasked with some work related to the IT infrastructure for data storage.

Structure of Project

The Superfund research center project proposal was designed around four research projects, each touching upon different aspects of PFAS remediation and harm reduction to both the environment and residents of Connecticut who were exposed to higher concentrations of PFAS due to their employment in firefighting, manufacturing, or construction. The administrative head of the project designated four supporting cores of co-PIs as required by the grant proposal. Integral to this success, the head of the project added the data management librarians to the Data Management and Analysis Core. The head of the project selected a professor of Information Systems in the School of Business who was experienced with ontologies to lead this core with the two data management librarians as cooperative principal investigators. The main challenge for the supporting cores, and especially the data management core, was to ensure that the data from the project is interoperable and mutually understandable between the different disciplinary research projects. A Superfund research center thrives upon interdisciplinary communication between researchers and the communities to which they are completing outreach.
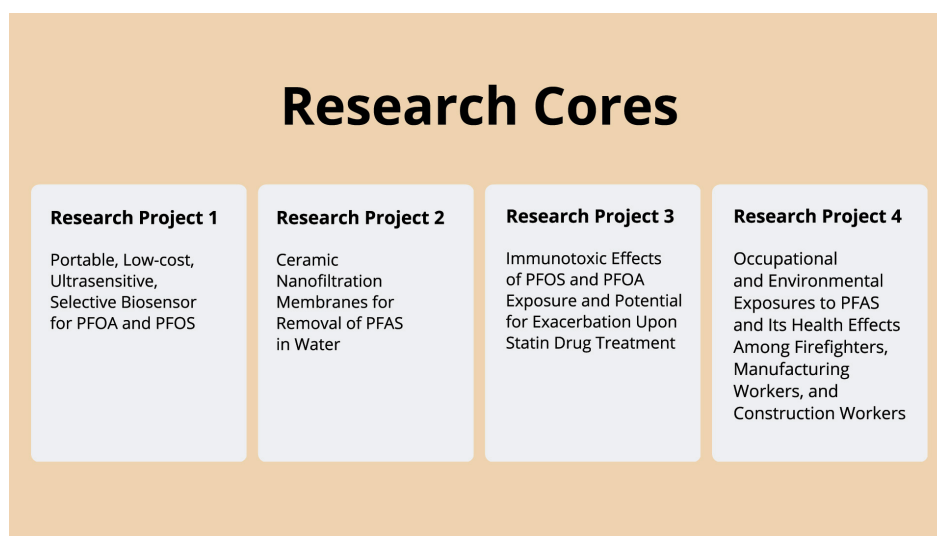

Figure 1: Research Projects under the grant proposal. The Research Core, comprised of 4 research projects is one of 5 Cores proposed for the center.

Notably, the work of the DMAC included work in areas that the librarians are not skilled in, including statistical analysis or managing servers and data repositories. The scope of support the librarians could provide was communicated to the grant PI. This work included reviewing data management plans, providing training on current policies and best practices, and recommending resources or repositories. Some of the work for the center would require the hiring of additional staff, either graduate students or full-time staff, with the skills and experience needed.

Adminstrative & Supporting Cores

Administrative Core

Data Management & Analysis Core

Community Engagement Core

Research Experience & Training Coordination Core

Research Support Core

Figure 2: An illustration of the four research cores in the project. Note that the Research Core contains four separate research projects.

Prior to the grant proposal the librarians were unfamiliar with the problem of PFAS contamination in the state of Connecticut. The librarians attended several brief meetings with stakeholders from the state level on the problem of PFAS contamination prior to writing their portion of the grant proposal. Poly- and perfluoroalkyl substances (PFAS) substances are omnipresent in our environment. They are contained in coating on packaging like pizza boxes or paper bowls, firefighting foam, waxed floss, or waterproof clothing. Due to greater environmental awareness, several US states have recently outlawed PFAS as a coating on food packaging, and it is now possible to purchase waterproof outerwear without a PFAS based coating from select retailers. These chemicals can be identified in cosmetics or other consumer products like ski wax by the word "fluoro" in the ingredient list. The greatest risk from this forever chemical originates in firefighting foam, which can eventually permeate the ground and enter aquifers, rivers, or groundwater in the absence of proper cleanup or remediation. If these chemicals accumulate in the tissues of humans after being orally consumed via food, they can contribute to reproductive harm, immune inflammation, liver, and kidney toxicity amongst other harmful outcomes (Rice 2018, 127).

Challenges of Job Classifications in Collaboration on Research Grants

In retrospect, it is evident from looking at the scope of the project that the work of two part-time data librarians, equaling one full-time (1.0) position, is insufficient to meet the needs of four large scale research projects with the establishment of a new Superfund research center. In addition to the amount of work and time needed to fully support the proposed center, there were other issues related to work balance and compensation that arose. The two librarians split their time between subject liaison work to fourteen different STEM departments in addition to offering Data Management outreach, education, and consultations. The librarians are classified as staff rather than faculty, and are members of a different union than faculty. Their union contract protects staff working hours and eliminates the possibility of overtime work with compensation.

The grant administration team initially assumed the librarians' work schedule was similar to faculty who teach 10 months of the year and may dedicate their other time to research and grants work. Faculty members frequently work longer hours and put in time on evenings and weekends. If a 10-month faculty member participates in a grant, the buyout of their grant-related work time rounds them up to the equivalent of a 12-month salary for their work distributed through the year. The librarian contract is a 12-month contract for a 35-hour week, but does not allow for overtime. Due to the librarians' classification as staff, if their time was bought out by the grant, the remuneration would be paid to the library and the librarians would not receive any monetary compensation for performing higher level work or for hours beyond their contracted schedule. While time buyout is a standard model for grant-funded work, it perpetuates the disparities in salaries for staff members in this situation. Alternate compensation structures exist at the librarians' institution but are less attractive or feasible. For example, one scenario would require working overtime for a significant period of time for free *before* receiving any additional monetary compensation. The main issue or the crux of the problem lies in the fact that the librarians are classified as professional staff members in their union, which severely limits their work scope and hours. The librarians are proud and active members of their professional union, but they acknowledge that the classification limits their job scope and remuneration when wishing to collaborate as equals with faculty. The librarians would have to get their position reclassified to approach any type of pay parity with faculty. Therefore, without the laborious and unlikely prospect of reclassification via a grievance, the librarians would likely perform additional free labor. If the superfund site grant was approved, the librarians would likely be completing what Rachel Ivy Clarke calls "invisible intellectual" work (Clarke, Stanton, Grimm, and Zhang 2022, 930). In their C&RL article titled, "Invisible Labor, Invisible Value: Unpacking Traditional Assessment of Academic Library Value," Rachel Ivy Clarke and her co-authors define "invisible labor" as work that is either unseen, unpaid, or unrecognized (2022, 930). In a similar vein, they also refer to "job creep," which is when job responsibilities multiply or expand beyond what is reasonable for one person (Clarke, Stanton, Grimm, and Zhang 2022, 937). Whether it is invisible labor or

job creep, these values are often attributed to historically feminized positions. In her article, "A Gendered Legacy, Librarianship and the Social Value of Women's Work," Christina Neigel highlights how reference librarians became designated as female assistants to a male leader (2020, 229). Furthermore, she highlights the importance for librarians, "to identify and challenge the external power structures that organize their work and impede their goals because of the patriarchal ways" by which their labor is assigned value (Neigel 2020, 231). Significantly, the framing of librarians as assistants and not intellectual workers can circumscribe their "opportunities for advancement" and higher pay (Neigel 2020, 231). In the librarians' situation, the two female-identifying librarians were working with a higher paid male librarian.

There are institutions where librarians are classified as faculty, but the logistics of pay for additional work on research grants tends to vary by institution and state. Nevertheless, it is notable that the end goal of research is to enable discoveries, the reuse of data, the sharing of information, and the creation of innovations to help humanity. With this end goal in mind, administrative hierarchies and divisions between staff and scientists infringe upon the scientific process. In April 2022, Marta Teperek, Maria Cruz, and Danny Kingsley co-authored a career column in Nature, entitled, "Time to re-think the divide between academic and support staff." In their column, Teperek notes that, "For research to advance and progress, diverse personnel must be able to contribute their talent and skills without being too restricted by conventional hierarchies" (Teperek, Cruz, and Kingsley 2022). Teperek and her collaborators note that participation in grants as one of the areas where it is difficult for staff and faculty to collaborate due to what they name as "arbitrary divisions:" "What hinders the quality of the research process is not the existence of distinct job profiles and varying responsibilities, but the constraints imposed on the different types of professional" (Teperek, Cruz, and Kingsley 2022).

When calculating the budget for the grant submission, the librarians proposed to allocate five percent of their time from their 35-hour work week to the proposed Superfund center, around 1.75 hours per week per librarian. This is the maximum amount of work they felt they could commit to while still performing their usual job tasks. The librarians could do a small amount of work in their regular work week with a buyout of their time, but could not fully support the needs of the potential Center. The biggest problem with calculating potential time and the related financial compensation was that the future work was largely theoretical at the time of writing the proposal. The PI was unable to provide much information since the DMAC was a new component of this type of grant, the Superfund Center would be a new entity at the University, and the workload and scope were unknown and would be determined if and when the Center was funded. Compensation for working on the grant-writing process itself was not required, as this was taken on under the librarians' regular duties as data management support for the university.

Librarians' Role in the Grant Writing Process

Prior to the formal proposal submission, the librarians attended several meetings with the entire research team and grant staff and explained their educational and outreach offerings. Once the grant proposal was underway, the supporting cores, including the DMAC, were assigned sections to write that supported their role in the proposed Superfund Center. The librarians and their faculty co-PI met weekly or biweekly to plan deadlines and discuss what information was needed. Part of the proposal included information about the data types and amounts researchers would produce. The librarians created a survey in Qualtrics so the four research project PI's could report this information. This would help the DMAC estimate potential storage needs and options. The librarians also used this information to consider potential outreach and education needs for the researchers.

If funded, the proposed Superfund Center would begin operation in late 2022. While not applicable for this grant cycle, the upcoming 2023 NIH Data Management and Sharing Policy would potentially affect future grant renewals and continued proposals. Information on this policy was added to the grant proposal. This is an example of the unique way in which the librarians were qualified to assist with the grant process.

The librarians also worked with their DMAC co-PI to discuss potential repositories for the Center, and whether an external vendor such as OSF or a homegrown repository service would serve the project better. The DMAC team spoke with university IT about whether they could be locally hosted or could be cloud-based depending on state and grant policies, or depending on the amount of support and infrastructure available. The librarians' skill was also valuable here when discussing federal funder mandates for making data openly available and which types of repositories would serve this need.

As mentioned above, once the work began on writing the grant proposal, it became clear that there was much that the librarians could not do if the center was funded. However, it is important to focus on what skills and services were provided and to not discount the importance of any role that the librarians played.

Outcome

In late 2021 the librarians learned from the administrative core that the grant submission was not funded and that the project lead will resubmit the application at a later date for a second round of funding. Detailed feedback in the grant makes it clear that the different research cores will need more assistance than the librarians can provide. Therefore, the librarians recommended that the administrative heads include in the budget for a second round of funding at least one full-time position to work only with the data management and analysis core. The librarians did receive a good score from the NIEHS on their written portion of the grant. It was noted however that the head of the core needed personnel with more experience working with biological data. Members of the DMAC should ideally be experienced in working with environmental health research as well as general statistics and biostatistics. Specifically noted in the reviewer's comments

was the lack of integration with other cores including direct collaboration on study design and data analysis. Feedback also noted that the researchers will generate heterogenous data types and it questioned how the DMAC would integrate and handle the variety of data created. It is worth noting that the librarians anticipated this need and disseminated a survey to all of the research cores requesting data types and information on their outputs prior to the grant application submission. The librarians ensured that all PIs responded to the survey.

Lastly, a note in the first-round application review by the NIEHS referred to the librarians as "doctors," assuming they each held a Ph.D. There were questions from the NIEHS about whether or not their salaries were calculated correctly, because they were significantly lower than the other co-PIs with PhDs. The librarians did note their MLIS degrees in their NIH biography for the grant process. While not explicitly stated, perhaps the concern was that the salary budget for their time was too low, when the NIEHS expected to see higher faculty-level salaries. In fact, it was not noted anywhere in the review that two of the co-PIs were librarians. In retrospect this should have raised questions on the grant PI's end and been clarified sooner. The head PI for the grant may not have been aware that librarians do not have faculty status at our institution or that most librarians have a terminal Master's degree rather than a PhD. In the future it may be helpful for NIEHS forms to offer an explicit place to note the role of data management professionals who are librarians and not classified as faculty.

Lessons Learned

The librarians and the lead grant PI should discuss the scope, compensation, skills, time of their work to be designated to the project at the start of the process. A lack of clarity of objectives and work regulations contributed to confusion, especially when communicating virtually during the beginning of the COVID pandemic. Looking ahead, the librarians will insist upon outlining the exact scope and amount of work they can provide when approached about projects.

In collaborations on grant applications and grant-supported research projects, librarians should be fully compensated for their labor. In addition, faculty should be provided with information that allows them to understand the contracts that circumscribe the scope of librarians' work. The grant application process was a useful learning experience in many ways, especially with regards to how to work in uncertain situations and to negotiate work options. Participating in the process of writing a grant was enlightening and helped the librarians to understand the experiences of faculty who are applying to large grants to fund their research.

When forming the budget for the data management core of the project, it is imperative to budget for a full-time data librarian for the duration of the research center. The University of Connecticut research data

librarians would be happy to liaise with a full-time position dedicated solely to a nascent Superfund research center if the proposal is successful in the future.

Recommendations

The librarians' major takeaways and advice to others from this experience are to know your worth, know your skills, and know your limits. Know the compensation situation at your institution. Truly assess your skills, the scope of work, and time commitments, and have difficult conversations before committing. Have conversations earlier about what work can and cannot be provided, and what is within the scope of your time and job description, to avoid feeling like being taken advantage of or being asked for work beyond your capabilities.

Define your role in the project and your time availability early in the process, and learn what things impact those, such as contracts. Find out how the compensation/overtime/buyout structures work at your institution and if there are alternate options.

The project discussed in this paper is just one example of a major interdisciplinary grant offered by a federal funder. It is inevitable that more research projects involving cross-disciplinary data management and communication between multiple research teams under a common goal will emerge in the future, and librarians will have opportunities to be involved. Knowing what goes into the process, and what the important considerations around work balance are will make for a more successful experience for all involved. In an ideal world, it would be easier for librarians to reclassify their work scope, position, or schedule in order to achieve salary parity for similar work as faculty.

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