Research as Design-Design as Research: Developing a Researcher-Driven Collaborative Model for Data Services

The Oklahoma State University (OSU) Library proposes a one-year $22,746 Sparks grant to develop an innovative proof-of-concept project management model and toolkit for researchers (and their graduate students) by characterizing how they perform research via customer journey mapping and, using a design thinking model in partnership with librarians, developing processes they can use to organize and maintain their data and be at the forefront of national efforts in making that data accessible and reproducible. Project team expertise includes customer journey mapping and service design from 1) The Library's Research and Learning Services Division (led by project director C. Ippoliti, who has conducted ethnographic studies and taught design thinking courses), 2) Data curation services and data management planning from the Library's Digital Resources and Discovery Services Division (led by co-project director and SHARE Associate N. Sump-Crethar), 3) The High Performance Computing Center's computational and data intensive research resources, and 4) The domain expertise provided by diverse [faculty partners](#) who committed to be part of this initial cohort and who were selected based on the size and type of data they generate, allowing us to analyze quantitative and qualitative small-medium data sets. Many other library surveys and interviews have been conducted to understand researcher behavior and habits related to data management. After a thorough literature review, we believe this is the first project to partner *with* researchers to develop workflows and services based on their own insights and with their direct involvement. This two-pronged method will allow us to employ a startup-style approach to get a model running quickly, then work on refining and adjusting it.

National Need and Relevance to Project Category: Research data management gained global attention in 2013 when funding agencies like the National Science Foundation established requirements making research data openly available and the research behind it replicable. Libraries are adapting to develop data services, yet a gap exists in the literature and in practice, which does not consider how researchers develop internal processes in managing data. This lack of deep understanding results in researchers viewing library services as an add-on rather than an integral part of the research lifecycle. Our proposal has national impact by addressing a high priority gap facing all academic and research libraries, while building on current strategic initiatives in this field. This project aligns with the National Digital Platform Project Category by assessing and developing a model and toolkit to handle data management workflows and practices.

Background: Last year, the OSU Library conducted a design-thinking-based data needs assessment to determine researcher needs, allowing us to develop a robust [research data services program](#) encompassing a [campus-wide research data services and cyberinfrastructure committee](#) to centrally coordinate activities; on-demand workshops and consultations on software carpentry, research impact, and building a data management plan; plus access and training for tools such as ORCID, Altmetric, and Open Science Framework. We interviewed 31 researchers across disciplines to identify: 1) Faculty needs for research data support relating to data management plans, data analysis and storage, data information literacy, and research impact; 2) The library's role in providing some or all of those services and resources; 3) Who else on campus offers similar services, and how we can create partnerships; and 4) The training librarians need to provide quality services to support these needs. Initial results (presented at the [2016 Association of Research Libraries Assessment Conf](#).) indicated that OSU researchers face the following challenges, which mirror studies conducted at institutions like [Oregon State Univ., Georgia Tech, Univ. of Iowa, Montana State Univ., Northwestern Univ., and the Univ. of Virginia](#) and indicate knowledge gaps about data management plan elements; ethical re-purposing and sharing of data sets; systematic storage of data methods and processes during projects; file naming conventions, Readme files etc.; and general lack of training. The proposed project for the Sparks grant involves some of the original 31 faculty and new faculty. It is a natural extension of our initial needs assessment, allowing us to work with researchers to identify solutions to challenges they discussed with us earlier. We had an overwhelmingly positive response to our call for interested faculty who specifically said they saw value in what the Library was trying to do, and would find this collaboration helpful. Instead of offering a monetary incentive, which cannot scale, we are offering in-depth support for the cohort's research projects, which clearly resonated, given that most faculty we asked enthusiastically agreed to participate.

Our results also build on the work of Christine Borgman and Carole Palmer, who have studied researcher practices and behaviors regarding data sharing and dissemination and who focused on the collaborative nature of data curation workflows and re-imagining today's knowledge infrastructures, including underlying mechanisms, attitudes, and politics surrounding their collection, preservation, and dissemination. Both assert that the reasons and practices behind data maintenance, sharing, and reuse remain largely unknown. We would address this gap by making these challenges and potential solutions much more transparent while articulating a stronger role for libraries as part of this process.

Project Description and Work Plan: The model consists of: 1) A customer journey mapping assessment of researcher workflows to reveal how researchers approach data management processes at the beginning, middle, and end of projects and what intervention and training is needed at each stage from the library and other campus entities. 2) A design-thinking process of data analysis where we take information from the customer journey mapping and use the design thinking process defined below to generate solutions to the most pressing collective challenges researchers identify. Customer journey mapping is a form of participatory design and a staple of user experience studies. It differs dramatically from a reference interview because the researcher *personally documents steps taken at each phase of the project* via charting and journaling instead of simply talking about them. Design thinking is a creative process generating solutions based on user-identified challenges. It is a highly iterative process relying on user input and feedback throughout the design process, and failure is encouraged. 3) A publicly available shared repository of materials consisting of the customer mapping and design thinking templates, the results from each set of activities, a preliminary model for the toolkit, and implementation handouts and materials. 4) Regularly scheduled discussion and training sessions for researchers to collaborate with librarians to implement proposed solutions. Following is our proposed schedule of completion: July 2018- train Graduate Assistant. Aug.--Oct. 2018- researchers complete customer journey mapping exercise. Nov. 2018--Jan. 2019- complete first round of data analysis to prepare for meetings to work through the design thinking process, then analyze that data. Feb. 2019- begin developing website and materials based on data analysis. Through May 2019- continue meeting with researchers to refine resources. June 2019- launch website.

Performance Goals and Outcomes: 1) Researchers will take an active role in determining their data management needs and challenges. 2) Researchers will actively engage with each other and the library community to develop shared problem-solving skills and techniques to assist them in managing data. 3) Librarians will demonstrate ability to work alongside researchers as partners, not simply supporters, of their data management processes. Assessments to determine if project goals are met will include surveys, self-reporting mechanisms, artifacts, and documentation of project deliverables. If the proof of concept is successful, the scaled project would consist of a multi-layered approach that trains librarians and provides them with access to the toolkit materials for conducting a similar project and connects researchers and libraries on a national level as part of an expert community of practice so that conversations and artifacts emerging from individual campus projects are shared across institutions. This would be accomplished via 1) A face-to-face training institute for librarians where they familiarize themselves with materials and processes in the toolkit; 2) A system of sharing and communication for researchers and librarians to enable regular discussions and sharing of work products and other materials; and 3) A website that disseminates the toolkit and implementation guidelines alongside results of subsequent studies. We have identified library institutional partners interested in participating in the next project phase, and we will solicit participation from diverse organizations like Historically Black Colleges and Universities and non-ARL institutions.

Budget: A $22,746 grant would cover the salary for one Graduate Assistant hired from a diverse pool with expertise in qualitative research methods and technology skills for data collection, analysis, and the development of the toolkit and website. A 12-month salary totals $13,800; a 12-month fringe benefit totals $1,405; and the combined salary and benefits totals $15,205. Adding 49.6% of indirect costs equalling $7,541 would total the grant at $22,746.