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putting the pieces together: theory and practice

eScience in Action

Using Customer Journey Mapping and Design Thinking to Understand the Library's Role in Supporting the Research Data Lifecycle

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Abstract

Objective: Customer journey mapping and design thinking were identified as useful tools for identifying deeper insights into the research data service needs of researchers on our campus with their direct input. In this article we discuss ways to improve the process in order to identify data needs earlier in the project life and at a more granular level.

Methods: Customer journey mapping and design thinking were employed to get direct input from researchers about their research processes and data management needs. Responses from mapping templates and follow-up interviews were then used to identify themes to be explored using design thinking. Finally, a toolkit was created in Open Science Framework to guide other libraries who wish to employ these techniques.

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Abstract Continued

Results: Outcomes from the customer journey mapping and design thinking sessions identified needs in the areas of data storage, organization and sharing. We also identified project-management lessons learned. The first lesson was to ensure the researchers who participate adequately represent the range of data needs on campus. Another was that customer journey mapping would be more effective if the responses were collected in real time and researchers were allowed more flexibility in the mapping process.

Conclusions: Modifications to the customer journey mapping and design thinking techniques will provide real-time responses and deeper insights into the research data service needs of researchers on our campus. Our pilot identified some important gaps but we felt that more subtle and useful outcomes were possible by making changes to our process.

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Introduction

Our IMLS Sparks! funded project consisted of working with a cohort of 27 faculty across STEM and social sciences fields, and an Advisory Board selected from a diverse set of institutions to act as consultants. Using journey mapping and design thinking, researchers were asked to document their goals and practices throughout the research lifecycle to develop workflows and services for their data needs based on their own insights and with their direct involvement. **Our project aim was to answer the question: What is the role and impact of the library in helping researchers manage their data along an entire project lifecycle?**

The purpose of this article is to highlight the two methods used—customer journey mapping and design thinking—as well as lessons learned for other libraries who may want to employ similar approaches for their data services.

Methods

Why we chose these approaches: We chose these methodologies to gain direct insight into researcher challenges, pain points, and perspectives and to provide us with a way to identify themes at a deeper level than surveys would allow us to do. In addition, we felt that these tools would allow us to gain buy-in from researchers as we outlined their challenges and identified solutions. We also wanted to define the library's role in the research lifecycle. Customer journey mapping would allow us to capture thoughts, feelings, and perceptions of researcher data management challenges by literally mapping their processes and decisions onto the research lifecycle for their projects. This approach differs significantly from an interview or other method because the researcher personally documents steps taken at each phase of the project via charting and journaling instead of simply talking about them. A journey map also identifies at what point (if at all) the researcher interacted with the library. This information allowed us to determine what that interaction entailed and if any improvements could be made. If researchers did not contact the library, we could find out why not, and if it would make sense for them to have contacted us. This also opens the door to analyze how we could change that for the future as we seek to identify the appropriate library interventions and help them meet each of these goals. Design thinking would then assist us in distilling the themes we identified in the maps and collaboratively design solutions to address them instead of collecting data in a vacuum and later designing activities that might or might not be adopted. In essence, the customer journey maps represented the first step of the design thinking process which would allow us to identify what challenges researchers faced when working with project data.

As part of this work we collaborated with STEM and social science faculty who were recruited based on research interests and previous working relationships. We asked them to describe the projects they were working on and the types of data that they were generating. We sent out a recruitment message via email and tabulated each response as it came in with the intention of including a wide range of disciplines and research types.

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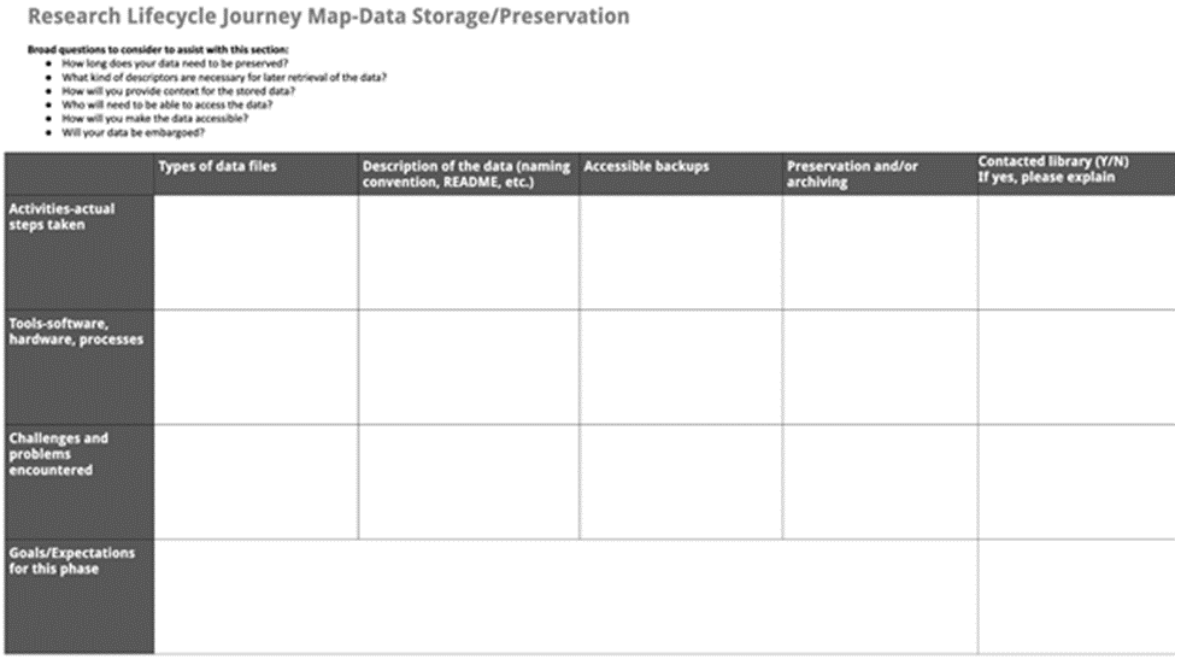
Customer journey mapping: Customer journey mapping is a form of participatory design and a staple of user experience studies. It is most frequently used for consumer studies in marketing research. Customer journey maps typically involve the following steps (Gibbons 2018):

- Understanding your "typical" user persona
- Identifying touchpoints, all of the things and people where the user is interacting with a particular element or in this case, their data processes
- Asking open ended questions to help users fill in their own thoughts

First, we created a matrix template with sections for each phase of the research lifecycle as defined by the Open Science Framework: search and discover; design study; collect data; store and analyze data; interpret findings. We asked the same questions for each of the phases: what steps they took to complete that phase, what tools they used, what challenges and problems they encountered, and what their goals were for that particular phase. We also provided a set of guiding questions specific to the particular section of the lifecycle to help them think about the details at that particular step. The matrix was intended to be general enough that different types of data would fit into these broad categories so that we could cluster and cross-tabulate responses across researchers and disciplines for each portion of the cycle as mentioned above. Templates for each researcher were shared via Google Docs to enable easy tracking and commenting, and we held an initial session to describe the overall scope of the project, timelines, deliverables, and their role as part of the cohort. We sent out some reminders prior to each deadline via email and offered to answer any questions that they might have.



Research Lifecycle Journey Map-Data Storage/Preservation

Broad questions to consider to assist with this section:

- How long does your data need to be preserved?
- What kind of descriptors are necessary for later retrieval of the data?
- How will you provide context for the stored data?
- Who will need to be able to access the data?
- How will you make the data accessible?
- Will your data be embargoed?

	Types of data files	Description of the data (naming convention, README, etc.)	Accessible backups	Preservation and/or archiving	Contacted library (Y/N) If yes, please explain
Activities-actual steps taken					
Tools-software, hardware, processes					
Challenges and problems encountered					
Goals/Expectations for this phase					

Figure 1: Sample customer journey map template

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What we learned: We ended up with many researchers whose projects were less suitable for our project than we had hoped. We learned that "data intensive" research should be separated from computational or modeling studies. In addition, many of the responses in the templates were too detailed for what we needed (i.e. getting into specific computational algorithms) and we were not prepared to ask for detailed explanations on such a large number of projects. In contrast, some were very generic and brief and did not adequately communicate what the researcher was thinking such that we could coherently identify a solution.

We ultimately determined that the journey map templates were too rigid which then rendered the design thinking questions difficult to formulate. We found that it would have been better to create flexible templates, allowing the researchers to complete them in an order that made sense for their workflows. We also realized that it would have been better to allow researchers to complete the journey maps in real time and for us to check in with researchers more often so that we could provide guidance as needed. We felt that more coaching was needed during the journey mapping process and we didn't have a good process in place to follow-up, nor to ensure that templates would actually be completed in a timely fashion.

If you want to use this method: The structure of the templates will impact both the way in which data is collected as well as how well the data is communicated. Data collected using a web form, for instance, has the advantage of being organized and accessed in a database. One approach that might make the journey mapping more effective is to begin by meeting with researchers and identifying commonalities in data types: survey data, lab data, field data. Then create templates for groups that are consistent with the type of data. Make sure everyone is clear from the beginning on how the process works and plan for frequent check-ins to catch questions along the way, including how much detail you are expecting to receive for the different portions of the map. This may also require starting with a smaller number of participants so that you can work through problems more easily before scaling to a larger cohort.

Design-thinking sessions: Design thinking is a creative process about generating solutions based on user-identified challenges. The design thinking process has several stages: *define*, *research*, *prototype*, *implement*, and *learn* (Ideo 2021). Within these steps, problems can be reframed, questions can be asked, more ideas can be created, and the best actions can be chosen. The steps aren't linear; they can occur simultaneously and can be repeated:

- *Define*: The goal of this step is to develop a deep understanding of researcher needs. The customer journey maps are the first step in the design thinking process where you are directly trying to understand your stakeholder's perspective
- *Research*: This stage is about identifying patterns or problem statements as well as needs and focusing on generating as many "solutions" as possible to solve them

- *Prototype*: This step begins the process to narrow down solutions to those that are deemed most feasible and are ready to be piloted either as a service, tool, or program
- *Implement and learn*: This final step involves refining solutions until a desired "final" result has been achieved

Based on the themes from the customer journey mapping portion of the project, we identified the areas and sub-categories described below. We then held a couple of sessions with researchers to gain additional information around these topics. The sessions consisted of asking them to elaborate on the challenges identified previously and letting them talk until that particular topic was exhausted. We also asked them to discuss what their ideal state might look like for these various areas in order to gain a better understanding of what types of solutions we might be able to design. We took notes as they talked and although we started with these specific questions, we let the conversation flow more freely as we asked follow-up questions or a new direction for the discussion was identified. Although we had hoped to gain a deep insight into the challenges researchers face when dealing with data, our themes were distilled into three main groupings: data organization, sharing, and storage.

- Data organization
  - Please describe your data documentation methods and needs
  - Please describe your version control methods and needs
  - Please describe your experiences (not skills but context) surrounding the use of Readme files
  - Please describe your experiences surrounding the use of open source tools to organize your data
  - What challenges have you had with file naming and data organization?

- Data storage
  - Please describe your data storage methods and needs
  - Please describe your data preservation methods and needs

- Data sharing
  - Please describe your data sharing practices and experiences-both within your research team and across the discipline
  - Please describe your experiences using publication as a method of data dissemination
  - Please describe your experiences surrounding the use of open source tools to share your data
  - Please describe your experiences providing attribution guidelines for other researchers to ethically reproduce or use your data

These sessions were great at pinpointing the difficulties they were facing, but we found it challenging to identify solutions. Limitations created by our journey mapping process created limitations in our design thinking.

What we learned: The design thinking sessions were most effective for identifying long-term institutional solutions for researcher problems. The outcomes supported efforts to generate funding for file sharing services and cloud data storage and contributed to long-term strategic planning. They did not produce many quick answers and in most cases, by the time that the project participants were engaged in the design thinking sessions they had largely found at least short-term solutions for the immediate problems that they were facing.

If you want to use this method: This approach requires a high time commitment for all participants and it is important that everyone is clear about the expectations for participation prior to the start. Consider how the design thinking results will integrate within the broader initiative that you are working on so that solutions and recommendations can, in fact, be added back into the project rather than at the very end. Consider what type of information and training participants will need in order to make a meaningful contribution to any new efforts that result from the design thinking process. The process itself can go in many different directions and requires a high degree of flexibility, but each step still has to be framed and coordinated in order to yield meaningful results. Framing can be difficult with the free-flow of ideas and conversation that are generated with this type of qualitative methodology.

Project information

- Project administration (requires OSF login): https://osf.io/rt4mu
- Advisory Board website: https://osf.io/6cjz8
- De-identified researcher surveys and templates: https://osf.io/tjgwd
- Meeting and design thinking session notes: https://osf.io/69k5a
- Project outcomes and deliverables: https://osf.io/kz9xw

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Disclosures

The content of this article is based upon a panel presentation at RDAP Summit 2021 titled "Research as Design-Design as Research: Developing a Researcher-Driven Collaborative Model for Data Services" available at https://osf.io/vd3n7.

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