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## Editorial

### Special Issue: Visualizing the (Data) Future

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### Focus

*As libraries and academic institutions evolve into “data-driven” organizations, they are looking for meaningful ways in which to convey their data to funding and regulatory agencies, licensing and accreditation boards, and institutional students, faculty and staff. This data-driven culture is being integrated into all facets of library operations, and data visualization services is emerging as a distinct library research and service development area.*

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Libraries as a service unit in their organizations are increasingly engaged in data services that support research, learning, and policy making for the communities they serve. Meanwhile, libraries are also striving to become a “data-driven” organization, a term coined by Patil and Mason (2015), by using operational data to provide evidence for library planning, management, and assessment. The so-called “data driven” organizations acquire, process, and leverage data “in a timely fashion to create efficiencies, iterate on and develop new products, and navigate the competitive landscape...” (Patil and Mason 2015, 6). While both library data services (such as curation, discovery, consulting, literacy training, mining, and integration of data) and data-driven culture are being established and integrated into library

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operations, data visualization has emerged as a distinct library research and service development area.

Why does data visualization matter for libraries? What roles do libraries play in data visualization? How can libraries meet the needs for data visualization services? These are the questions libraries face when trying to develop data visualization services. Answers to these questions will explain not only the rationale to the constituencies about the need for offering such a new service program, but also provide a feasibility assessment and planning for suitable service models. The articles included in this special issue present some exemplar answers in addressing these questions.

Providing data visualization consultation for researchers is one of the most common services among the articles in this special issue. There are different ways, however, to initiate and sustain the service. Two authors, Andi Ogier and Michael Stamper from Virginia Tech Library, share their lessons learned and the guidelines they developed for embedding data visualization as a library service in the research lifecycle (Ogier and Stamper 2017). The consultation on visualization design process is structured in three parts: purposes of the project, research process, and design process, and each part consists of a set of questions to be asked of the clients during consultation processes. The authors demonstrate how to apply the guidelines to the consulting process with two case studies, which are described following the three-part guidelines showing how the guidelines helped staff capture the goals of the data visualization and designed the approaches suitable for the data points. These guidelines will be useful for other academic libraries in providing similar services.

Besides embedding data visualization services in the research lifecycle, another type of consulting service is directly performing a data visualization project for a research unit or group. Fei Yu and Barrie Haynes report on a research impact assessment project that the Health Science Library undertook as a service project for the Cancer Cell Biology Program at University of North Carolina at Chapel Hill. Unlike the embedded data visualization services in the research lifecycle, this service project is a research project involving data collection, cleaning, processing, and analysis, which eventually presented the results in various visualizations. The authors give a detailed account on data collection methods and impact measurements, highlighting the different visualization tools used to produce appropriate plots and charts to allow for easy detection of impact scopes and categories. As the paper mentions in the discussion, applying bibliometric data analytics and visualization for research impact assessment is a service area potentially in demand by institutional units.

Two papers in this special issue focus on visualization tools from two different perspectives. Atwood and Reznik-Zellen (2017) developed a rubric for visualization software evaluation and

tested it with six visualization tools. As there are many visualization tools on the market, the rubric offers guiding criteria for evaluating and decision making when choosing visualization tools. What stands out about this rubric is that it was developed using visualization tools research, and, as such, it can be applied to other software tool evaluations. Another paper on visualization tools introduces the experience of using Tableau as a starting point for the library to provide data visualization services. It offers recommendations for libraries developing library support for Tableau. Although focused on one tool, their processes and experience have value for libraries to initiate data visualization services with Tableau and other visualization tools.

Training in data literacy has been a perpetual challenge since the initiation of library data services, and data visualization is no exception. Kristin Briney (2017) relates how she applied learning theory to understand the learning of data visualization and designed an interactive workshop to teach data visualization. Briney applied Bloom's learning taxonomy to generalize four important aspects of learning data visualization: read, practice, critique, and create. With this guiding pedagogy, she created and offered a "Data Visualization 101" workshop.

An interesting and important message from this piece is, while learning data visualization is a service offered by the library, the librarian can be empowered to feel comfortable with data and information literacy competency that previously felt daunting to master.

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