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putting the pieces together: theory and practice

Data Please!: Expanding the Role of Libraries in Data Science through Digital Scholarship

Halie Kerns, Binghamton University, Binghamton, NY, USA, hkerns@binghamton.edu

Abstract

Objective: As data science becomes more integrated into research and teaching, libraries are well-positioned to support this work. This study examines how a digital scholarship team at Binghamton University enhanced engagement with data science by assessing faculty, staff, and graduate student needs. Through focus group interviews, the study identifies key support gaps and outlines strategic initiatives to strengthen interdisciplinary data science programming within the library.

Methods: A qualitative approach was used, involving 26 focus group interviews with faculty, staff, and graduate students across STEM and related fields. Participants discussed their data science work, tools, training, and perceived resource gaps. Qualitative coding analysis identified key areas for library support.

Results: The study revealed three primary areas for library expansion in data science: (1) fostering interdisciplinary collaboration through outreach, (2) developing structured data science programming aligned with campus needs, and (3) establishing physical and digital infrastructure for data-intensive research. In response, the Digital Scholarship team implemented a three-semester data science programming plan, enhanced research community engagement, and contributed to a dedicated data science space in the upcoming Digital Scholarship Center.

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Data Availability: Focus group interview questions are available under the article Supplementary Files:
Appendix A: Digital Scholarship Needs Assessment

Abstract Continued

Conclusions: Findings support the library's role as a vital hub for data science. By aligning digital scholarship services with campus needs, the library can bridge gaps in data literacy, tool accessibility, and collaborative opportunities. While initial implementations show promising engagement, ongoing assessment will be necessary to refine services, particularly for undergraduates and emerging technologies. This study provides a model for other libraries to expand data science programming effectively.

Introduction

Digital scholarship work in libraries has been around for more than two decades, but the demand for integrating emerging data science skills has grown significantly in recent years. In the fall of 2023, a qualitative research study was carried out by the Digital Scholarship team at Binghamton University's Libraries in focus group interviews. The study focused on the intersection on how existing digital scholarship library work could expand their data science services and better integrate with the data science campus community. Data science has not traditionally had a home in library programming, however, those at the institution believed it should become part of the Digital Scholarship team's offerings to balance out the existing digital humanities focus. However, this ask needed to be balanced with the role of librarians as generalists on topics to serve a wide range of patrons, and not experts like other data science practitioners on a campus.

This tension led to several key questions: If digital scholarship librarians are to provide data science programming, what should it entail, and how should they learn and integrate it into their work? How can existing efforts be expanded or adapted as to not overwhelm the team? What is the best way to communicate library investment in data science services? The librarians conducting the focus groups sought answers both for their institution and for librarians in similar roles elsewhere. The study aimed to align the directions of the Digital Scholarship team with the evolving demands of the university.

Literature Review

Digital Scholarship and Data Science Intersect

One of the most common questions Digital Scholarship librarians can receive is, "What *is* digital scholarship?" While it can be defined as involving digital tools and methods to aid in research and teaching, it remains a nebulous term on purpose–ethereality allowing adaption of all matters of practices and ever-changing technology. Another way to think to think about it is as a verb and a noun as defined by Hensley and Bell (2017) when they describe digital scholarship as a support system for activities but also "an act of creation." Digital scholarship librarians offer services to help with digital research and pedagogy on campus, but the product of those services also delivers digital scholarship itself. What exactly that verb or noun looks like

depends on who they are talking to. Popular digital projects include but are not limited to websites, podcasts, data visualization, and text analysis. Digital scholarship librarian positions exist to collaborate with and offer support for these projects from inception to completion.

While the concept of digital scholarship does not necessarily necessitate the involvement of libraries, over the last few decades, they have become central to the conversation because of the interdisciplinary nature of the subject. Kasten-Mutkus, Costello, and Chase (2019) describe the library's unique situatedness as, "the capacity for multi-view support of projects from their early stages and can facilitate interdisciplinary collaboration" (1). In theory, the library can act as a connector for the many institutions on campus that participate in digital scholarship work, trying to undo silos that keep these actors from collaborating.

To define the concept of "data science" is an equally daunting task. Oliver et al. (2019) describes more what it does than what it is, stating it "applies concepts from statistics and computer sciences to question numerous domains" (242). Most descriptions of these services in the library include a long list of what they can include, often with very different goals and skillsets. Alongside the library's historical penchant for data, this wide range leaves infinite possibilities for what data science programming in libraries could look like.

At a fundamental level, data science deals with data just like digital scholarship does—the meaningful distinctions hinge on who is doing the dealing and for what purpose. Together, academic librarians have started to use the intersections of these two fields to expand the potential for projects, pedagogy, and general digital literacy on their campuses. Thus, the positioning of data science within an existing digital scholarship team and structure in the library, allows for a better understanding of what that programming can look like without recreating an entirely new service. An interdisciplinary nature allows digital scholarship to nurture the potentials of data science, while still guiding the services to match with what normal digital scholarships functions look like at an institution, such as workshops, events, instruction, collaborations, and spaces.

Data Work in Libraries

Although data science in libraries in a new concept, working with data is something library workers have a great familiarity with. In fact, libraries may even offer or complete different flavors of data work without naming it under the data science umbrella. A popular moniker is just "data services" which Wachowicz and Esty (2024) describe traditionally as a "focus on data sources as a format regardless of discipline" that has continued to evolve to create complex workflows (1). It is important to distinguish that this librarian's responsibilities are for internal library data and not external service, although they note that changing landscapes include collaborations for more outward facing work.

Besides data librarians, other related library interests in data science include a focus on data literacy and different data practices such as linked data and bibliometrics. Data literacy, is related to library goals of information literacy, but for data specifically. The 2021 book, *Data Literacy in Academic Libraries: Teaching*

Critical Thinking with Numbers, edited by Bauder explores this with examples. They define two different approaches to data literacy instruction: data-related competencies for different fields and overall data comprehension and evaluation for all areas of life, closely aligned with information literacy. Data literacy concepts are fundamental to digital scholarship, although it is more focused on the concepts, application, and critical thinking then necessarily the creation of digital projects themselves.

The multiplicity of data science allows it to be the backbone of all this related library works—data librarians, data literacy instruction, internal data practices—without it ever necessarily being named as such. One example of a text that puts this all together is 2022's *Advancing Data Science, Data-Intensive Research, and Its Understanding Through Collaboration* which links data work in the libraries through both internal work and external work including digital scholarship. In the forward, they synthesize this work declaring, "Libraries thus have crucial roles to play in developing the field of data science and in applying and adapting the tools and techniques of data science to library operations" (xx). Libraries must both develop with the field of data science and develop library functions within it.

Data Science Frameworks

Library data science work is being done, it is not necessarily being named and promoted as such. Nor is the library necessarily casting itself as part of the data science community on campuses with this work. However, there is a push to change this. To achieve more data science in libraries, Mani et al. (2021) recommend identifying the existing data science structures within the campus ecosystem and finding the most strategic way for the library to participate with their existing strength (293). Instead of recreating the wheel, they argue the library should be adding value to existing and support for data-intensive research and pedagogy. This could mean becoming liaisons for departments, joining groups, participating in consultations or even meeting with researchers one on one. Other key components from Mani et al.'s framework include developing new infrastructures in the library (data storage and computing power) and skill building and curriculum support for data science instruction in libraries (2021).

Almost all the frameworks point out necessary core skills that are necessary to be able to insert oneself into an expert space. However, Du and Khan narrowed the infinite possibility down for librarians to be able to picture what a well-rounded data science repertoire would look like. They report on seven core competencies for data science skills for the librarian based on the data life cycle which include: Data Visualization, Data Analytics, Programming, Text analysis, Data Curation, Data Ingestion, Data Management (2020, 150). The seven competencies create a framework and path forward for librarians who want to program and offer data services in their libraries. As will be seen later in the paper, this framework, specifically, was adapted when thinking about the data science curriculum for Binghamton University.

One other framework came out in 2018, International Federation of Library Associations and Institutions (IFLA) entitled *A Concept Data Science Framework for Libraries*. This framework was drafted to outline

suggestions for how libraries can integrate data science into their services. They argue that these services are natural extension of the library's traditional role and in doing so, it only strengthens itself as a cutting-edge partner in education and an essential part of the academic ecosystem. Their suggestions are similar to the other two frameworks in terms of skill building, infrastructure, and data management examples. However, it also includes suggestions concerning collaboration, much like existing digital scholarship frameworks, and involvement in leading advocacy and policy for data.

Expanding on Existing Services

Even outlined in approachable steps, the truth is that the fact that most librarians do not have the time, budget, or capacity to gain the level of expertise that data scientists on their campus have. However, this could be true of any subject specialists who still find ways to assert their expertise. Librarians can still be valued members of whatever community they choose by acting as connectors between people and knowledge. Oliver, Kollen, and Hickson (2019) describe the librarians as relying on their strengths and role as consultants when it comes to data science collaboration and deeper learning (245). Likewise, Herndon, while suggesting tools and strategies, states that while it's not necessary for librarians to become expert programmers, "they do need to be aware of common problems and the community standards for solutions to them [and]... develop a comfort with the lingo and resources of this new community" (2021, 25).

Several case studies of data services in academic libraries are explored in *Data Science in the Library: Tools and Strategies for Supporting Data-Driven Research and Instruction* (2021), edited by Herndon. One such example deals with a physical space in the library for data science services. This offers an opportunity to merge data science goals with digital scholarship goals physically. They conclude that, "for libraries that wish to reduce barriers to data science, a dedicated space provides an opportunity to offer specialized software, training and support that may not be available anywhere else on campus" (Herndon 2021, 132).

Although the nature of digital work is that it does not exist physically, having a physical space can be a physical indicator of the library's expertise and commitment. People come into the space and face the physical manifestations of concepts that might otherwise be too vague. Hannah, Heyns, and Mulligan (2020) describe, "physical centers within libraries [as] provid[ing] focal points for contemporary research, positioning librarians to take an active part in producing digital scholarship" (695). This space can take many forms but needs to be collaborative and adaptable to many data science activities, including workshops, speakers, group projects, and solo research.

The data science programming opportunities for libraries are vast and it can be hard to pin down exactly the services that they can offer. Some existing examples of data work and data-related instruction exist in libraries already. This coupled with recent suggested frameworks for data science in academic libraries, help paint a picture of what is possible and identify gaps for libraries to fill. This is where having digital scholarship infrastructure in place to guide these goals can be advantageous. The interdisciplinary nature

of data science aligns well with digital scholarship services, providing a structured yet flexible foundation for integrating data science into library programming, and possibly physical spaces. While librarians may not always possess the same technical expertise as dedicated data scientists, they can serve as connectors, bridging knowledge gaps and guiding campus communities toward data science learning for everyone.

Methodology

This study was conducted at Binghamton University by a newly hired Digital Scholarship Librarian for Data Science and STEM, with help from the rest of the team for gathering contacts. The Digital Scholarship team at the time, existed as three-person team with an assistant head who had been the first digital scholarship librarian at the institution, and an additional Digital Scholarship Librarian for Digital Humanities. At the time, the digital scholarship presence in the libraries had been around for only five years and was only incidentally involved with the vast data science community on campus.

The focus groups for the study were planned in the summer of 2023, with the first interviews beginning in the last week of August. Subsequent interviews were carried out through the end of October 2023. During this window, a total of 26 people were interviewed in the focus groups. People were recruited using a targeted snowball method. Members of the digital scholarship team brainstormed initial names for interviewees. The targeted interviewees were from STEM areas or departments that did related work. Departments included in the focus groups are as follows: School of Management, Anthropology, Biological Sciences, Nursing and Health Sciences, Political Science, Student Affairs, Mathematics, Art and Design, Engineering, and Education.

From there, the network grew naturally, with the interviewees suggesting more names from their own contacts. Participants included both those who knew of the Digital Scholarship team and those who did not. A total of 52 people on campus were contacted, with the 26 interviews successfully carried out, and a fifty percent success rate was achieved. This included twenty faculty members (77%), four staff members (15%), and two graduate students (8%). This covered all the intended groups, although not as evenly distributed as researchers would have liked. Undergraduate students, while welcome to participate, were not actively sought out because of their past limited involvement in digital scholarship services.

Each focus group sessions ranged from ten to sixty minutes and were held in person and virtually on Zoom, one on one. The project was IRB-approved, as such all initial emails requesting meetings and interview questions were the same throughout the process. The interview questions consisted of seven main questions which can be seen in Appendix A. These questions were meant to be very general and open ended, so they were able to be applied participants who had a wide range of background and experience with data science work and tools. The interviewer took notes either by hand (in-person) or typed notes during each session.

Each focus group began with the interviewer introducing what digital scholarship was for participants. Many of the first group of participants that were interviewed had participated in DS-related activities such as the Digital Humanities Research Institute (DHRI) or past workshops. However, as the interviews branched out, more people were hearing about digital scholarship on campus for the first time. General follow-up emails were sent for interviews, and those who were new to digital scholarship were also sent links to services related to their work and teaching.

After the interviews ended, the notes were anonymized and analyzed. The qualitative analysis involved hand-coding notes from interviews into topical categories for comparison. This involved four steps. First, researchers read through the interviews and recognized common themes and significant answers. From there, ten main categories were organized. Once the categories were chosen, researchers when through and coded the interviews with these ten categories. Finally, the coded sections were organized together, and themes were pulled out for comparison. Topics included participants' relationship to data science and digital scholarship, what technology and digital scholarship skills were part of their work, their thoughts on AI, data management, and storage needs, and what they hope to see in the future from their field and the digital scholarship team. Table 1 includes examples from the survey question: "What Technology do you use?" The answers were coded and organized six categories and underneath are specific tools that were mentioned. From these results, librarians could understand how technology is being used, what is being used, and can start to brainstorm ideas to support this work. It also helped to form a network of practitioners of different methods across campus.

Table 1: Table of themes and tools from the survey question: What Technology do you use?

Data Analysis	Teaching	Research	Data Management	Programming	Graphic
R	Blackboard	Qualtrics	FileMaker Pro	Python	Illustrator
Python	Brightspace	NVivo	SQL	JavaScript	Unity
SPSS	Panopto	Otter.ai	Notion	SQL	Cinema 4D
Stata	LucidChart		Endnote	MATLAB	Oculus
Power BI					360 Cameras

Initially, the results from the focus groups were written up as a report submitted to library leadership and made publicly available to the campus. Internally, the focus groups ended up supplying the basic for planned data science programming by the digital scholarship team in upcoming semesters. The feedback from the focus groups helped the team plan both future digital and physical spaces with data science goals in mind. It was also an exercise in connecting with new scholars to digital scholarship and many participants were introduced to the Digital Scholarship team for the first time.

Findings

Participants and Digital Scholarship

Participants' answers were specific to their area of work and were not situated in digital scholarship itself. Whether they were students, faculty, or staff members, this remained consistent. Unlike digital humanists, who may have a better understanding of their work fitting into such a label, no participants referred to their work as "digital scholarship" or "data science" or contextualized it as such. A correlation was lacking between STEM and data science focus groups and their ability to see themselves in the digital scholarship community.

Whether or not participants knew about digital scholarship library services, they all conducted projects involving digital scholarship and data science skills, including data analysis, machine learning, database management, VR (virtual reality), mapping, 3D imaging, website building, and data visualization. The variety of approaches demonstrates the broad disciplinary reach of digital scholarship and data science. Once participants understood what digital scholarship was and the role of the library, the questions asked helped to elicit feedback that informed researchers about what possibilities existed for data science in the library. Feedback from the focus groups was categorized into three primary themes:

1. Access and Data Management
2. Skill Development
3. Collaborative and Communicative Research

Access and Data Management

One theme that emerged across focus groups was that, regardless of title, researchers linked libraries to access to research materials. Many participants cited lack of access to materials as their biggest hurdle in digital research pursuits. While this issue falls outside the Digital Scholarship team's jurisdiction, it demonstrates how the library and librarians are perceived as a monolithic entity rather than distinct service providers. A select few also mentioned access to digital tools, something the team had more control over but did not often purchase. Many participants reported paying out of pocket for the tools they needed. There was no single platform or tool that emerged as universally necessary. However, there was greater overlap than expected across disciplines. Coding-wise, many participants mentioned using R for their analysis (approximately twelve), followed by Python (nine mentioned using various libraries). Beyond these, others used SPSS, Stata, and SAS, depending on available funding.

A surprising theme that emerged was how many participants relied on outdated, sometimes precarious, older technology for their work. Subscription costs, security concerns, and lack of better alternatives were frequently cited as reasons for this reliance. Some researchers even maintained legacy computers running older operating systems solely to support a single program, hoping the system would continue functioning.

While this issue is outside the Digital Scholarship team's immediate scope, it highlights the complex relationship researchers have with technology in their work.

Beyond tools and software, data storage was another critical concern. Half of the participants elaborated on their data management practices, which varied greatly by field and project type. Many expressed that data storage services were lacking on campus, indicating a gap in unified institutional knowledge. About a third of participants explicitly requested more storage for their data. This gap represents an opportunity for the library to offer infrastructure, such as a repository, as well as instruction on best practices for data management.

Skill Development

Participants who had previously attended digital scholarship events provided feedback on their experiences and how these related to their work. This accounted for 15 participants who had engaged with the Digital Scholarship team in some capacity. Several stated that, while they had appreciated the workshops at the time, they wished for more sustained learning and application to reinforce their skills. Participants suggestions provided valuable insights into potential areas of support as well. Requests included more coding training—particularly in R—resources for developing a web presence, and opportunities for students to learn data visualization tools beyond their coursework.

The most significant challenge mentioned was the limited time and bandwidth to seek out and learn new skills. Several participants noted that, although they attended digital scholarship events, they struggled to apply what they had learned outside of a single workshop. Despite these challenges, all participants expressed a desire to explore new ways of communicating their knowledge and engaging with different communities such as interest in tools or projects done by their peers. Discussions on skill development also revealed a clear divide between faculty and graduate students in terms of digital tool usage. Graduate students were often responsible for working with digital tools for analysis and visualization, while faculty directed but did not directly instruct on tool use. This dynamic suggested that graduate students required additional support in skill development, which in turn would benefit faculty members who relied on them for digital work. Overall, feedback was positive about past skill development and excitement was clear about future opportunities.

Collaborative and Communicative Research

Many participants primarily discussed their research within their own disciplines, describing the digital tools that support their work. However, there was a growing recognition of the need for interdisciplinary collaboration, particularly among those with ideas for digital projects but lacking the technical infrastructure to execute them. At least four participants noted a lack of formal mechanisms to facilitate such collaborations, leading to fragmented or siloed research efforts. Not many suggestions were made to improve this but

given the diversity of data science applications across fields, significant opportunities for interdisciplinary engagement remain untapped.

Interviews with digital scholarship librarians reinforced that the library, as a neutral and well-connected entity within the university, was uniquely positioned to address this challenge. By fostering connections between scholars with complementary skills and providing a space for interdisciplinary exchange, the Digital Scholarship team could play a crucial role in bridging gaps, facilitating collaboration, and supporting the development of flagship digital research projects.

Limitations

The biggest limitation of the study was the number of participants interviewed from each campus group. Despite efforts to recruit a balanced number of faculty, staff, and graduate students, graduate students were underrepresented in the sample. In addition, with the IRB requirements, all interview questions remained fixed throughout the three-month data collection period, despite new questions emerging as the study progressed. More questions would have been added concerning popular topics such as data management and AI would have been included if this had been more flexible. In hindsight, additional steps could have been taken to connect participants with digital scholarship resources earlier in the process, such as providing links to relevant services. Despite these limitations, the study successfully met its initial objectives, offering valuable insights into data science programming opportunities for the library.

Results

Growing Relationships Across Campus

The interdisciplinary nature of the data science scholarship necessitates a sustainable and well-connected network if community and collaboration are to be achieved. Collaborative research and the need to facilitate that across a siloed campus were main themes that emerged in the findings. Although they cannot run it themselves, librarians are uniquely situated to act as conduits for such a network on campus, if not the locus for most connections.

As it stands, from the interviews, it was clear that those external to the libraries did not necessarily understand what digital scholarship could offer them and how it connected to data science work. Data science programming needs to be a clearly stated goal in the programming and promotional materials to help people better facilitate this connection. As a result, the Digital Scholarship team has begun to utilize central campus event posting and use data science specific verbiage for events. Not only does it help better promote events but helps to alert people outside of the current digital scholarship community and bring in fresh faces who stumble on event postings, especially those looking for data science activities. After posting all events on it for a semester, workshops especially have seen a noticeable boost, especially with undergraduate students who are the main audience for central campus posting.

The team also attends meetings for at least six groups on campus related to digital scholarship and data science work to understand what work is being done in these fields. Some of the participants in the focus groups are also part of these groups who still were not familiar with digital scholarship. It seems is also not enough to just be part of data science groups on campus, the Digital Scholarship team needs to be leading and visible in these groups and projects.

One successful example of leadership helping co-run DataViz, the Data Visualization Interest Group on campus. This group, while having committed members and an interested community, had been fairly dormant since the beginning of the pandemic. With a push from digital scholarship librarians after this study, they were able to plan two events in the last academic year including a well-attended Data Visualization showcase that garnered more interest in the group across several disciplines. With this interest, an organizational board was created for the group to become more active in upcoming semesters, and the librarian became synonymous on campus for this effort. Instead of being a subtle supporter, the Digital Scholarship team has begun to partner to help groups like these thrive.

Thematic Data-Related Programming

Throughout the focus groups, many different specific skills were suggested as future workshops. It was clear that people across campus were hungry for data- science based offerings by the Digital Scholarship team. Every semester, digital scholarship librarians lead, plan, and host various events and workshops for the campus. While these events have also included data-based topics, it is clear that they can be expanded and marketed more clearly.

However, this clear desire, needs to balance with the reality of a digital scholarship librarians time and budget limitations. While Binghamton University does currently have a team of librarians, this can change. and these offerings may need to be adapted and scaled depending on circumstances. To situate data science within digital scholarship is combining two incredibly vast fields that could go in so many directions. It becomes important to narrow the focus with clear learning objectives to not overwhelm librarians and the campus.

To achieve this, the team has created a three semester long data science campaign for programming including events and workshops. A visual breakdown of this campaign can be seen in Table 1. This campaign was inspired by Du and Khan's (2020), seven core competencies for data science librarians. Each semester focuses on one of three branches of data science important to scholars: data visualization, data analysis, and data management. Each one of the branches is broken down into skills, tools, and projects for consideration when building the curriculum. In between the branches are skills that apply to every semester: data cleaning, programming, and text analysis. Although there is overlap, this helps narrow the focus and make planning more manageable, while still creating variety. It also may help to attract different audiences who need to build up their certain skills for their research.

The first semester's focus was Data Visualization and included a multi-topic, loosely linked workshop series. Straddling the line between a series of classes and standalone workshops, the series was meant to be flexible. If participants wanted to come to every session, they would have a nice toolbox of visualization skills by the end. Although some of the topics had been covered in single workshops from the Digital Scholarship team before, the goal was to make the learning more cumulative. The workshops were well attended, especially by a new undergraduate audience. Good feedback was collected from participants, many of them participants in the focus groups, and the next semester's theme Data Analysis is in the works. Along with workshops, additional data visualization events were included in the schedule including DataViz Matchmaking during Love Data Week that matched participants data with a data visualization tool and a Data Visualization showcase with the DataViz group on campus.

Although the team cannot measure the success of the three semesters yet, with one semester down, they are hopeful that interest will continue to grow, and the audience will expand. One advantage of the thematic semesters is the production of new learning materials each semester. Although a lot of work in the first three semesters to create and plan materials, if used in a cycle they can continue to be reused and expanded on as the team builds out data science services. In their current tutorial format, they can also be shared with people outside workshops during consultations and other events as learning materials. This could cover many of asks of focus group participants who wanted to learn or wanted their students to learn specific skills. A nice repository of lessons will be built over time to be adapted. As such, one attendee of all the Data Visualization workshops in the first semester has adapted the slides and materials for his own Data Visualization class.

Physical and Digital Presence

Although many years in the making and not a result of the study itself, Binghamton University is set to open a space dedicated to digital scholarship in the library. Feedback from the focus groups helped to formulate the spaces in the final plans. As a result of the study and need to tie digital scholarship and data science together more publicly, an area dedicated to data work was proposed for the new Digital Scholarship Center and enthusiastically approved by the administration. This will be dedicated space within the center to support data services, including but not limited to data literacy, data management, and data visualization. While much data and data science work are being done on campus, this dedicated space will hopefully help to promote the library's investment in this work, ability to offer support, and general exploration into data for those interested.

One other place to grow and improve the presence was the website for digital scholarship. Even shared prior to the focus group interviews, it was clear that it was not accurately and succinctly communicating what digital scholarship was and the link between digital scholarship and data science for practitioners or those looking to increase their data science skills. Since, plans have been drafted to launch a more comprehensive virtual presence that clearly outlines what the team offers. The website relaunch will include a page for online tutorials which will be built out more extensively with the new semester model. With each of these

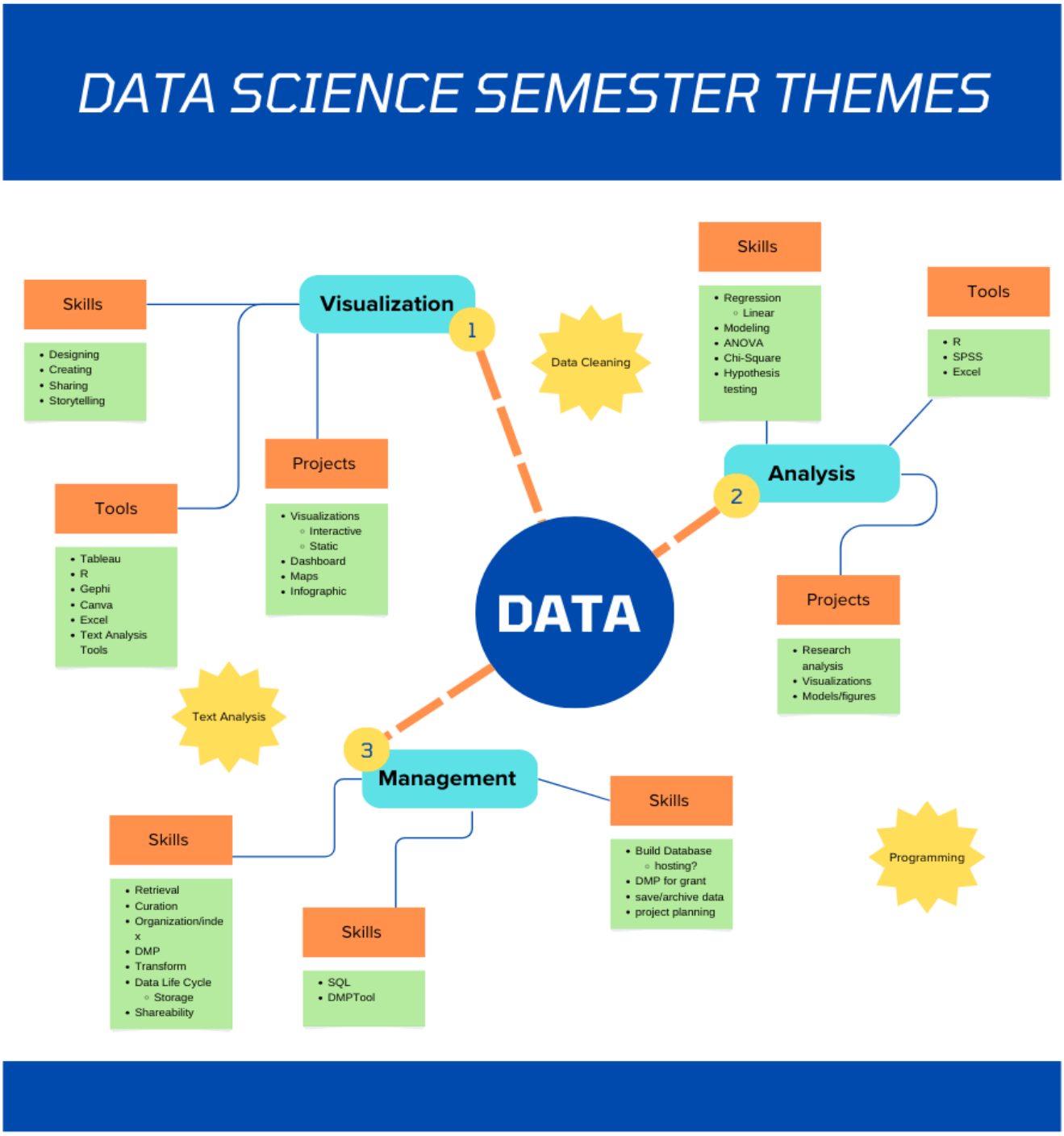

Figure 1: Organizational Chart of Three Semesters Worth of Data Science Themes.

three results (growing relationships, thematic programming, and presence) already in action with promising results, the Digital Scholarship team at Binghamton University with continue their outreach and assessment to promote and pivot services as needed.

Conclusion

Digital scholarship can be everything to people or nothing at all, depending on how well it is adapted and promoted to a campus. This study sought to identify ways in which digital scholarship librarians could better support data science work on campuses and find opportunities to lead that expansion using direction with direct feedback from those who would benefit. By conducting focus group interviews with faculty, staff, and graduate students across various STEM related disciplines, the thematic findings underscored the growing need for interdisciplinary collaboration, skill development, and better access to digital tools and data management resources.

While the digital scholarship team cannot fill every gap, these three themes were then narrowed down into three areas for expansion: growing relations across campus, thematic data-related programming, and physical and digital presence. In response to these findings, the Digital Scholarship team has taken several steps to enhance its services and presence for data science through these three arenas with examples of successes in each. Early results indicate that these efforts are successful thus far.

While these actions are ongoing, continued assessment and adaptation will be necessary to meet the evolving needs of the campus community. Future research should explore ways to further engage undergraduate students, support emerging technologies, and refine data science programming in alignment with institutional needs. The Digital Scholarship team at Binghamton University will continue to reflect and assess on their data science offerings, assess how they fit within the greater digital scholarship picture, and remain flexible and responsive to campus needs. In doing so, they hope to foster a dynamic and supportive data science support ecosystem in the library.

Not every campus' approach to digital work and data science will be the same and the experiences of those in libraries will differ. However, no matter where they are, it is impossible to expect digital scholarship and other types of librarians who may be responsible for data science programming to learn every facet of data science to the level of other scholars on their campus. Using Binghamton University's focus groups and resulting activities as an example, librarian hope to demystify data science programming in the library and simplify scalable options for everyone.

Competing Interests

The author declares that they have no competing interests.

Data Availability

No data was generated by this project.

Focus group interview questions are available under the article Supplementary Files:

Appendix A: Digital Scholarship Needs Assessment

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