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Data Science LibGuide for the Clark Family Library at Washington & Jefferson College

CIS 400: Capstone Project

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## Introduction

“Data science isn't about the quantity of data but rather the quality." — Joo Ann Lee (20 Data Science Quotes by Industry Experts, 2023)

In the past 30 years, Data Science has grown to include businesses, government institutions, colleges, universities, and organizations worldwide. It is now [being used](https://www.dataversity.net/data-science-use-cases-2/) by governments, geneticists, engineers, and even astronomers. Data Science has become an important part of academic research. In terms of research areas, Data Science has expanded to include the biological sciences, health care, medical informatics, the humanities, and social sciences. Data Science now influences economics, governments, and business and finance. (Foote, 2021)

Washington & Jefferson College has recognized the important role Data Science plays in our world and offers both a major emphasis and minor in Data Science to its students. The major emphasis in Data Science is available to students majoring in CIS. The minor in Data Science is available only to students not majoring in CIS. This includes areas such as Mathematics, Psychology or Economics. (washjeff.edu). As part of their educational experience, faculty, staff and students need access to reliable, meaningful resources specific to their area of study. In other words, students need access to quality data.

Today’s technologically savvy students no longer require a brick-and-mortar building. Rather, libraries offer LibGuides, a web-based platform, or content management system (CMS), used by libraries to create and share online guides for research and learning (Dobbs et. al., 11). LibGuides provide a centralized, customizable, and accessible platform for libraries to showcase their resources and services to users. They are particularly useful for creating subject and course guides, offering 24/7 access to information. This includes eBooks, journals, articles, data repositories, as well as resources required by their professors to complete assignments, research projects and other responsibilities throughout their studies.

There are currently over 125,000 LibGuides, created by more 25,000 librarians at more than 2,000 libraries. (Dobbs et. al., 12). The Clark Family Library is no exception. It connects library users with resources in an online format. In addition to general resources, the LibGuide offers 46 content specific areas, such as Accounting, African American Studies and Computer and Information Sciences, just to name a few. Washington & Jefferson College recognizes the need for a subject based LibGuide for the Data Science major and minor.

## Executive Summary

A Data Science LibGuide is needed to provide resources, tutorials, and guidance on data acquisition, analysis, and visualization. It serves as a central hub for accessing information, tools, and best practices within the rapidly growing field of data science. Beginning with a discussion with my stakeholders, Dr. Rebecca Rapp and Dr. John R. Ladd, I created a Data Science LibGuide with specifications to meet the needs of the Washington & Jefferson College community.

Throughout my capstone project, I frequently met with my stakeholders, collaborated with library staff, researched several other Data Science LibGuides, created a Gantt Chart, interviewed faculty members who teach courses pertaining to data science, conducted user testing, obtained deliverables, as well as created several documents, including a scope statement, a risk register, a transition document, and a lessons learned document. After analyzing stakeholder, staff and student input, I launched the official Data Science LibGuide on April 15, 2025.

## Literature Review

The interdisciplinary field of data science is one of the fastest growing fields of study. Data science applies concepts from statistics and computer sciences to questions in numerous domains. The demand for support in data science literacy is vital for today’s faculty, staff and students at the collegiate level. The academic library is specifically established to provide training and guidance in content relevant to data science. Supporting data science efforts presents an opportunity for academic library involvement. (Oliver et. al., 3)

At its core, the main objective of an academic library is to connect its users with available resources. The need for subject-oriented guides for library users serves as an invaluable source of information in a one-stop shop of sorts. (Dobbs et. al,. 23) Developed by Springshare, LibGuides is a content management tool allowing librarians to organize and present library collections to users in a customizable fashion using Web 2.0 applications. As described on the LibGuides product home page, “[LibGuides] combines the best features of blogs, wikis, and social networks into one package designed specifically for libraries.” (Bushhousen) With this in mind, it is important for academic libraries to explicitly address the growing need for data science training.

Subject guides, including those in Data Science, are disciplinary resource discovery maps created by librarians to assist library users in independently locating resources within the library. A study at the University of Canterbury in 2019 measured the usage of subject guide content versus universal content resources. The results found that disciplines that had “high access rates for subject guides were more likely to commence information resource searches in subject guides or a specific database. Disciplines that had low access rates for subject guides were more likely to commence information resource searches in Summon or Google Scholar.” (Tyson, 2). One can conclude that when a well created LibGuide that meets the needs of its users is available, the primary goal of a library lives up to its expectations.

How then should a specialized LibGuide be designed? A combination of aesthetics, practicality and usability are the primary goals of good LibGuide design. Librarians assist individuals dealing with deadlines, grades and due dates, all of which can be stressful. According to Donald Norman’s book *Emotional Design,* attractive things work better in stressful situations. If we accept this assertion, LibGuides must consider design with utmost importance. Additionally, today’s library users have grown up in the age of the Internet with daily bombardments of visuals and media. Organized information that utilizes entry points, focal areas, uniformity, color and contrast helps make use of the LibGuide successful. (Dobbs et. al., 104)

Convenience and ease-of-use have also been found to be primary factors for academic information seekers. (Connaway et. al.). Convenience can be defined as “complete access to resources, beyond merely discovering and identifying them” (Connaway et al., 187). Making sure that information is easy to find, including the use of short descriptive titles, friendly URLs and the implementation of tags to create keywords for your guide makes information easier to find. Additionally, content must be brief and concise. LibGuides can become overwhelming if they contain too much content, so it's important to keep them organized and focused. One must arrange the LibGuides so users can easily scan and navigate them.

Ultimately, information in a LibGuide must be reliable and up to date. Libraries are trusted sources of information for users. Any and all publicly available content must be as accurate as possible, especially in the rapidly evolving world of data science. This involves a lot of maintenance, regular monitoring to make sure guides aren't outdated and that links work.

One must also consider several stakeholders of a LibGuide. These include students, faculty and librarians. Each of these groups has different needs. Students rely on 24/7 online access to library sources and information in a one-stop setting. Resource customization, specifically in data science, should offer easy to use tools for research within the discipline. Faculty might use the LibGuide not only for research of their own, but also as a tool to resources for their classes, including information and data repositories directed toward specific assignments and projects. As hosts of the LibGuide, the needs of librarians must be considered. Discussion for regular maintenance and updating must be easy and convenient to all those involved. (Dobbs et. al., 24-28)

Finally, once a LibGuide has been created, constant consideration, not unique to data science services, is that of finding the appropriate media for effectively communicating library services with the audiences that would benefit from those services. In many cases, once a critical mass has been reached, word of mouth has proven very effective in increasing participation in drop-in sessions. Faculty and staff recommendations have driven many new users to library services. Library websites provide some details on events and services but require the audience to already be looking for those services on the library web page. Self-promotion is also an effective tool to advertise a LibGuide. Email, posters, links on college websites, and mailing lists serving key communities on campus allow broadcasting services to broad, yet appropriate audiences. Working with coordinators of specific majors or departments, in this case the CIS Department and any others offering a Data Science minor, can been effective. (Oliver et. al., 13)

The need to engage with data science information of data science should be embraced by academic libraries. Given interest in "big data" approaches, there can be no question of its importance. The pace of change in data science also requires the need for a more online approach, which can be easily maintained and changed at a moment’s notice. The use of a Data Science LibGuide offers a new mode of 24/7 engagement with campus users that would solidify the academic library's position as a campus hub for the data-driven twenty-first century. (Oliver et. al., 22)

## Scope Statement

**Project Name:** Data Science Minor LibGuide  
**Team Members:** Eric Pastore

**PROJECT PURPOSE**

This project aims to create an updated and easily accessible database/LibGuide of the Clark Family Library at Washington & Jefferson College, specializing in resources for the Data Science Minor.

**PROJECT SUMMARY AND JUSTIFICATION**

The Computing and Information Studies Department of Washington & Jefferson College recently created a new course of study: the Data Science Minor. This academic course of study will be offered to students with various Major areas of study, as part of their undergraduate curriculum. Students with any major can choose to complete the Data Science Minor. Departments offering courses in the Data Science Minor include the following: Economics, Computing and Information Studies, and other areas of study. As a result, students in these courses will need access to a diverse set of resources that provide access to information students need to succeed in their coursework.

The current LibGuide available at the Clark Family Library offers information and resources hosted by Computing and Information Studies. This project aims to either update/improve the current LibGuide or create a new LibGuide to better accommodate users’ needs in this new area of study. Using inputs from current Faculty and Students, the updated version of the LibGuide will include databases of relevant sources corresponding to the curriculum.

Washington & Jefferson College students and staff will have online access to the LibGuide. They will also be able to easily navigate the databases and obtain results to better suit their needs. Access to the updated LibGuide will be available to all potential users within the Washington & Jefferson College Institution. The overall format of the LibGuide will mirror older versions. A How-To Guide with detailed yet easy-to-understand instructions about the new version will be provided in the form of a document so that users can refer if they have questions about how the new LibGuide works.

**DELIVERABLES AND REQUIREMENTS**

1. · Research and Analysis
   1. Will research the current LibGuide as a base for the update.
   2. Will research and document similar LibGuides and other online resources in the field of data science at other colleges and universities
   3. Will create a survey via Google Forms for current faculty and students to gather and analyze information about their wants and needs
   4. Will collaborate with Library Staff, including archivists, about their wants and needs
   5. Interview or conduct focus groups with clients and stakeholders and analyze their inputs
   6. Obtain any existing data on use of the current LibGuide and add new resources.
2. · Recommendations
   1. Consider the benefits for updating/improving current LibGuide Versus creating an entirely new LibGuide for Data Science Minor
   2. Consider the time needed for maintenance and updates.
   3. Consider how to organize the resources on the LibGuide so that they are easy to find and use.
   4. Consider which disciplines/major areas of study will be using the LibGuide and how to organize resources based on their wants and needs.
3. · Prototypes for Testing
   1. Will present 2 –3 different designs to Library Staff, Academic Staff and students for their preferences
4. · System with the following features…
   1. Collaborate with Library Staff to create a more user-friendly research guide including the following features:
      1. Links to Databases
      2. Links to Library Catalog Items
      3. Links to Useful websites
      4. Links to various Media Types, such as Images, Videos, etc.
      5. Links to Library Subscriptions relevant to content
      6. Integration with current Library Catalog
      7. Create features to identify and report broken/harmful links within the guide
      8. Option to contact Librarians for Assistance
      9. Option for accessibility standards for users with disabilities
      10. Potential to share LibGuide with other Faculty members
      11. If possible, ability to monitor how users interact with the guide.
5. · Testing Procedures for Final Design
   1. Conduct user testing to determine usability and ease of use for the Final Product.
6. · Training and Documentation…
   1. Will document how to use and update the LibGuide for future semesters.
   2. Provide final LibGuide for use by Faculty and Staff for the Fall 2025 semester and beyond. These uses include updating the LibGuide and adding extra resources.
   3. Collaborate with Ms. Martin, Dr. Ladd and Dr. Rapp to add as Editors/Owners of LibGuide and Document how they will update and add resources to the LibGuide.

**SUCCESS CRITERIA**

Success of the Data Science Concentration LibGuide will be determined by user feedback and usability. Students in various major subject areas will be able to easily find and use sources for their assignments. Faculty and students will be able to address their needs and offer suggestions that would add new links and resources to the LibGuide for future use.

**CONSTRAINTS**

The Project must be fully completed by May 1st. Implementation should be completed 1-2 weeks in advance of the project deadline.

* The current LibGuide will be used as a reference source upon which the new version will be built.
* The LibGuide will only be accessible and updatable for Faculty and Students exclusive to Washington & Jefferson College.
* Faculty, Students, and Clients might want to stick to the LibGuide, which limits their abilities to navigate and find datasets due to the LibGuide not having any way to filter them (datasets).

## Gantt Chart Narrative

This project began on January 10th, 2025, when I was assigned the task of creating a Data Science LibGuide for the Clark Family Library at Washington & Jefferson College. Before working on this project, I needed to research Data Science and LibGuides in general. Before researching and analyzing, I met with my Clients, Dr. Ladd and Dr. Rapp, and Samantha Martin about how this project would unfold, as well as how I would create the LibGuide itself. As data science is already linked to computer science, I decided to use the current Computing and Information Studies LibGuide as a base for my work on the Capstone project. I also researched other Data Science LibGuides from various colleges and universities, including UC San Diego, the University of Virginia, and Penn State University. Finally, I interviewed faculty members from several different departments who teach courses required for the data science minor. I requested their input about what they believed should be included in the Data Science LibGuide as it pertained to their particular courses and subject needs. These factors created my first prototype.

I met with my clients to share and discuss the prototype. My clients made several suggestions. This included renaming and moving several boxes, removing anything unrelated to data science and moving text mining resources to other sections. They reminded me of the primary purpose of the LibGuide and asked me to create a document on how to update it in the future. I implemented their suggestions and updated the LibGuide accordingly so that I could use the second prototype for user testing on April 3, 2025.

I created two specific tasks for the students to complete to test the effectiveness and usability of the LibGuide. The first task was to choose a potential dataset from the current Data Science LibGuide and download it. The second task was to find and access a specific book included in the LibGuide, *Probability, Statistics and Data*. After doing so, I asked the students to answer several questions concerning their perceived ability to complete the task in terms of ease, time and effort. I determined that some tab sections needed to be renamed and that a keyword search tool should be included to make the LibGuide easier to navigate. After making those changes and creating visuals for my user testing, I met with my clients to discuss how the user testing went. We made our final changes to the LibGuide and launched it on April 15, 2025.

## Gantt Chart