A Library Website Migration

Project Planning in the Midst of a Pandemic

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ABSTRACT

This article provides a background on the migration of the California State University (CSU), Stanislaus library website from an open-source platform to a content management system specifically designed for library websites. Before the migration, there was a trial of different content management systems (CMS), a student usability study, and consultations with outside web and systems librarians to acquire better insight on their experiences migrating a library website and their familiarity with the different CMS trialed.[1] The evaluation process, website design, and usability study began before the pandemic and the global shift to remote services. However, despite this shift, the timeline for the migration was not altered and the migration was completed as planned. Within a year, the library website migration planning, designing, trialing, and structural organization was completed using a modified waterfall model approach.

BACKGROUND

Completed under a sudden time limit, the website migration project for the California State University (CSU), Stanislaus library website is both distinctive and relevant to other libraries who plan to complete a redesign of their website, on both desktop and mobile screens, to meet accessibility requirements under a limited schedule caused by unforeseen circumstances—in this case, a global pandemic and sudden shift to remote work. The website migration project included a reconsideration of the content management system (CMS) the library was hosted on.

CSU Stanislaus, surrounded by agricultural landscapes and settled in the central valley, is a Hispanic-serving and minority-majority university. Ethnic minorities make up 70% of total enrollment and three-fourths of the undergraduates are first-generation students.[2] In fall 2021, a little over 8,800 FTE (full time equivalent) students were enrolled and total enrollment reached 10,500.[3] The university has two campuses, Turlock and Stockton, and four colleges: the College of Science; the College of Business Administration; the College of Arts, Humanities and Social Sciences; and the College of Education, Kinesiology and Social Work.

The CSU Stanislaus library website has been designed and redesigned over twenty years for services and content updates, university and library rebranding, and to comply with web accessibility requirements. Before the library website migration in 2020, at the start of the COVID-19 pandemic, the website was developed and produced using the Drupal platform (version 7), an open-source CMS. The contents of the library website have been updated from time to time since its first years and the website's front-end design has been modified during the past few years.

Before the website migration from Drupal to Springshare LLC, the library explored various CMS, including WordPress and Joomla. Initially, staff encountered issues on the former library website hosted on Drupal. Over the years, the library's website became difficult to maintain, due to the continuously modified written framework, and to implement new branding across the website's content and overall theme.

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The objective of the website migration project was to effectively enhance the website's interface for usability and to meet current standards and guidelines for accessibility. Additionally, the university was set to launch a new design of the institutional website, which required that the library emulate the university website's design for uniformity. In preparation for the university website redesign, it was necessary for the library to model the new university design, explore CMS, and migrate the library website.

A possible migration from Drupal 7 to Drupal 8 was investigated from 2017 to 2018, when the former web services librarian was in the process of redesigning the website; however, the redesign and migration was not completed. It was discovered around the same time that editing or upgrading the initial design and development of the library website, which utilized a community developed design heavily customized over the years, would make the migration extremely difficult. Any editing that triggered modification of the locally customized theme caused other elements of the website to break or collapse, particularly the website's layout design, including the header, footer, and menu.

It quickly became apparent that it would be more sensible to begin the redesign of the website infrastructure on a platform starting from scratch. A new design would also facilitate the application of the latest accessibility and usability standards. A complete rebuild would also afford the library the option to consider other web management platforms. This would evidently be a challenging feat. So, a modified version of the waterfall model was adopted.

For this migration, a simple cascading approach was chosen as it worked best with the natural flow of the library's planned migration. The waterfall model consists of the following objective processes: requirement analysis, design, construction, acceptance testing, and transition.[4] For the planned migration, the requirement analysis was confirming that I would have a local and cloud server available for trialing the CMS and developing a website design. The design and construction processes would be complete when the new website design was created, the CMS trials were finalized, and outside web services and systems librarians were consulted. The testing phase would be complete when the student usability studies were concluded. As explored in my previous article, "Navigation Design and Library Terminology," a user-centered usability study was conducted to assist in the library website redesign and create the website prototype. The prototype was designed to assess the library website's front-end elements as well as the layout theme and overall design. Lastly, the transition, or migration process, would be the final planned objective in the approach.

As the web services librarian, I worked as the website migration project manager. The project manager migrated the final and redesigned library website and website content, conducted the student usability studies, tested the CMS and created a CMS recommendation for the library, and consulted with outside librarians on their experience migrating a website and using Drupal or Springshare as their library website CMS.

TIMELINE AND AN UNEXPECTED PANDEMIC

The CMS trials began in fall 2019 and continued until summer 2020. The former library website used Drupal 7, so Drupal 8 and Springhare's LibGuides CMS were set to be trialed.

The trials consisted of developing and designing a new library website on the platforms. Experiences were documented and the design process was recorded for analysis and comparison

of the platforms. This information was used to determine which platform would best support the new website. Consultations were also sought from various web services librarians, system librarians, and information technology professionals.

Table 1. Timeline of the website migration

Semester	Activities
Fall 2019	• Trial Springshare LibGuides CMS[5] • Develop library website design prototype • Consult outside web and systems librarians on their migration to LibGuides CMS
Spring 2020	• Trial Drupal (Version 8) • Test website design prototype through a student usability study[6] • Complete, compare, and analyze LibGuides CMS and Drupal platform trials
Summer 2020	• Finalize library website design • Migrate former library website content to final chosen platform • Complete library website migration

CMS TRIALS

LibGuides CMS and Drupal were the systems trialed for the library website. Drupal was used for more than two decades and consideration was given to upgrading to the latest version of the platform, Drupal 8. Springshare LibGuides CMS was trialed as library staff and faculty were already familiar with LibGuides and subscribed to several other Springshare applications, including LibAnswers and LibChat for virtual research consultations, LibCal for reserving library spaces, and LibInsight for user analytics.

Trialing of LibGuides CMS began in fall 2019. A website prototype (design, theme, homepage) was developed and designed using the platform. The platform was analyzed and explored heavily since it was a platform that had not been previously utilized by our library.

LibGuides CMS offers unlimited advanced customized groups. Features like publishing workflow management, discussion boards, internal sites, various account types, password protections, and IP restrictions, and courseware integration via LTI, were also researched during the test.

In terms of content creation and maintenance, there were limitations under LibGuides CMS. LibGuides CMS has a built-in framework, ideal for libraries, with default settings that may disrupt or limit complex customization. At the time of the trial, additional support from Springshare was needed to override default settings. Also, LibGuides CMS, compared to Drupal, did not provide an option for tracking revisions on guides and content.

Drupal, a highly programmable free open-source website platform, was the previous platform the library website was hosted on. Like all upgrades, Drupal 8 offered a series of new features and improvements, from framework to themes. As a highly programmable platform, it requires

mindful designing and programming to establish the infrastructure and design. Drupal 8 was tested and trialed on a development site in February 2020.

The development site on Drupal was utilized for the final evaluation of the CMS. When the campus was ordered to partially close in March 2020, the home page and foundational design were completed; however, the development site was inaccessible remotely due to a block by the campus firewall. The development site resided on a protected local server on campus, and special permissions were required for remote access. Unfortunately, I was not granted the special permissions required in due time, so the development site on Drupal was put on hold. Based on projections after creating a foundational design in February 2020, it would have taken about six months to complete the overall website design. Remotely, I continued the Drupal 8 evaluation, considered the results of librarian consultations and the literature on Drupal as a CMS.

CONSULTATIONS AND CMS COMPARISONS

Generally, the difference observed between both platforms is that LibGuides CMS is a content management system primarily designed and maintained for library websites, whereas Drupal is a framework for all sites, including highly customized websites.

To support the CMS comparisons, six web services and system librarians were consulted prior to the migration. The librarians were from distinct institutions: two community colleges and four 4-year universities ranging from 2,000 enrolled students to 30,000 enrolled students, and library departments from 10 to over 200 library personnel.

A systems librarian from a university of about 2,000 enrolled undergraduate students, regarding their experience migrating their website from Drupal to LibGuides CMS, shared that, "[their migration] took a couple months . . . we worked with campus IT and Springshare to 'flip the switch'." A digital services librarian from a university of over 10,000 enrolled students explained, "the entire transition probably took about 6–8 months." The time to migrate a library website would depend on the size of the website, which was also influenced by the size of the campus. With more than 10,000 students, the CSU Stanislaus library website migration project was scheduled to be completed by the end of the summer semester, from June 2020 to August 2020.

Creating a new website from scratch on Drupal proved to be a longer process than creating a new website on LibGuides CMS. A systems librarian explained that "[LibGuides CMS] is also quite streamlined compared to trying to maintain a more complex platform like Drupal, which makes it a bit easier for librarians who are not full-time professional coders." Still, LibGuides CMS is not as robust and did not offer the level of customized creation that Drupal offered for general websites. The systems librarian added that although it is helpful to have a web services or systems librarian who can code full time, "turnover happens and some libraries can't be sure there will always be someone on hand who is comfortable doing that coding." Ideally, having a full-time programmer is valuable for any library managing their own website; however, it is currently not the case for our university library.

A user interface developer from a university of over 30,000 enrolled undergraduate students described their experience using a large amount of CSS to override default settings in LibGuides CMS. They explained, "we have a large amount of overriding CSS, not to mention that it makes [it] messy. When building a site [in LibGuides] you can do whatever you want as long as you know where to put your code, utilize the JS libraries Springshare uses, implement CSS to override their

system default items/styles and use their API." Before finalizing our migration, we were required to contact the Springshare technical support team to override default settings in LibGuides CMS. However, the default settings are implemented to guide nonprogramming librarians when creating web content. A web services librarian from a university with 2,000 undergraduate students enrolled stated, "I don't think [Libguides CMS] will be anything like a Drupal or Wordpress CMS. But, I do believe that their software is the perfect niche for libraries and librarians."

LibGuides CMS required getting used to as CSU Stanislaus library staff were accustomed to hosting the website on a CMS that allowed file transfer protocol (FTP). As a systems librarian explained, it can be difficult to organize a large amount of coding in LibGuides CMS since "you don't get your own server that you can configure and use for things like FTP storage." The experiences shared by librarians were similar throughout our process for creating the new site and design, and these consultations in particular were not only insightful but helped prepare for and organize the structure of the website before actually migrating the content.

An additional component considered before choosing a CMS was the technical support and server options available for each. LibGuides CMS is cloud-based and hosted by Springshare, which currently uses Amazon Web Services (AWS). Upgrades are implemented by Springshare overnight, as well as minute-by-minute base backups. For the most part, systems and web librarians were satisfied with Springshare technical support to implement these changes. With Drupal, the institution can choose whether to host their site on a cloud or local server. During our migration in summer 2020, we sought assistance from Springshare technical support to modify security certificates and custom domain names. If a site is hosted on Drupal, the librarian can implement security certificates and update custom name domains without having to contact the Drupal technical support team. It is fundamental for a library to consider these features as well, especially if under a set timeline.

These consultations with developers and with systems and web librarians aided in the understanding of what LibGuides CMS and Drupal offered based on general comparisons, programming, customization, and technical support.

CMS ACCESSIBILITY COMPLIANCE

The accessibility levels of each CMS also supported the final decision of the chosen CMS. According to the Web Content Accessibility Guidelines (WCAG), there are three levels of accessibility conformance: A (lowest), AA (midrange), and AAA (highest).[7] Currently, the target level of accessibility for CSU campus websites is AA, which also includes all the guidelines found under conformance A.

Regardless of the foundational framework for both LibGuides CMS and Drupal, it was determined after exploring accessibility on these CMS that developers should regularly test the design and content customization for accessibility. Ultimately, the accessibility levels of a library website and its mobile responsiveness are dependent on the local management and development of the sites.

WEBSITE DESIGN: USABILITY STUDY

Concurrent to the consultations, trials, and design development, a usability study was conducted in February 2020 with a total of 38 university student participants, including undergraduate

students, from freshman to seniors, and graduate students. The usability study was organized to test the website navigation design prototype that was built and used during the CMS trials. Students' feedback would guide the decision of whether to design an audience-based navigation menu or a topic-based navigation menu.

The study was conducted in a closed and monitored library room with laptops prepared. Students were asked to answer questions and complete tasks to test the website design prototype menu navigation design. Each student's actions were recorded through screen recordings and visual observation, while assigning numbers to students to ensure anonymity, e.g., student 1, student 2, etc.

The following seven tasks were used for the student usability study:

1. Find research help on citing legal documents—a California statute—in APA style citation.
2. Find the library hours during spring break.
3. Find information on the library study spaces hours and location.
4. You're a student at the Stanislaus State Stockton campus and you need to request a book from Turlock to be sent to Stockton. Fill out the request-a-book form.
5. You are a graduate student and you need to submit your thesis online. Fill out the thesis submission form.
6. For your History class, you need to find information on the University's history in the University Archives and Special Collections. Find information on the University Archives and Special Collections.
7. Find any article on salmon migration in Portland, OR. You need to print it, email it to yourself, and you also need the article cited.

During each study, students' actions were screen recorded using Snagit, screen capture and screen recording software installed on the laptops. Data collected included the ease of access in terms of navigation behavior, the number of clicks, web pages visited, and the time it took for students to complete each of the seven tasks. That data was recorded and analyzed from the anonymously saved screen recorded videos. Students were also asked to answer questions at the end of the study in the form of a written survey, which was then collected and utilized to support the final decision of the outcome of the prototype design.

The results of the usability study provided the library with a variety of outcomes and several elements were integrated to lead the redesign of the library website's header and main menu. The results of the study showed that the prototype's design navigation, an audience-based navigation, was not as user friendly as predicted; therefore, the library website prototype design would need to be edited and modified to revert to the current navigation design of the existing website, which is a topic-based navigation.

Students had difficulties with the audience-based navigation design since it required them to select an "audience type" under the menu (fig. 1). Their selection was determined by assessing where they believed the information was found. Since most students did not understand the structure of the website, they did not know how to utilize the audience-based navigation to complete the seven tasks. Although they found that the navigation design of the website was clear and simple, it required a "getting used to."

The results also highlighted the effects of the use of library terms. To make menu links exceptionally user friendly, clear and common terminology was added. An additional component was a search-all search box for the website, which was advocated by the student participants. Based on navigation results, the main menu and submenus were also structured to not only be clear and organized, but for popular pages to be mapped and linked in more than one menu.
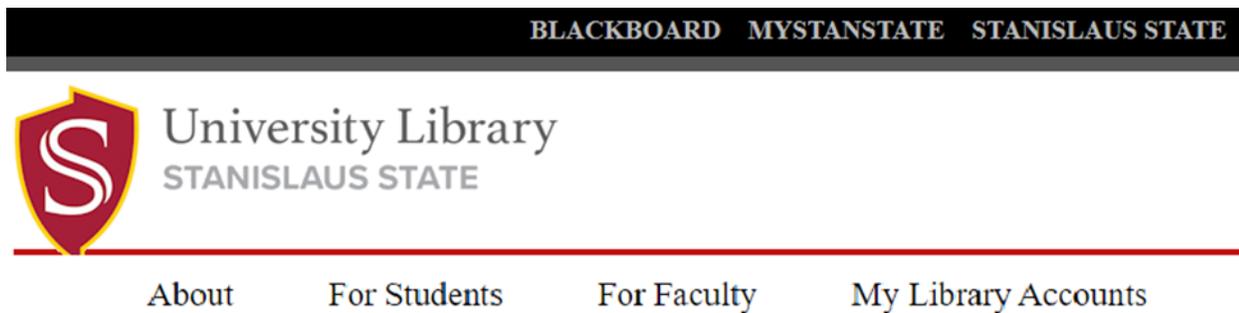
Figure 1. Screenshot of the audience-based navigation design developed for the library website prototype.
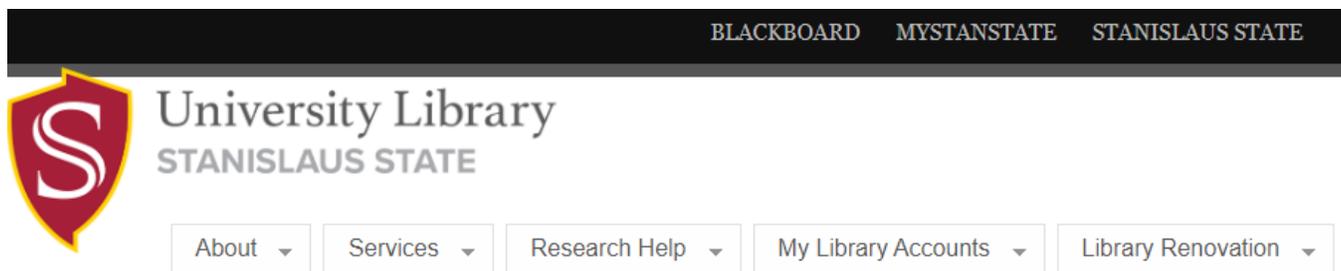
Figure 2. Screenshot of the topic-based navigation in the former library website.

The design structure of the website relied on the organization and management of the website pages. To maintain a congruent structure, it was necessary to choose a navigation design that met the needs of our students. In this case, the results determined that the topic-based navigation was preferred; thus, the management of website pages and submenus was modified to fit this navigation.

The usability study was focused on testing the navigation design of the website and the navigation main menu. Given the helpful feedback from users and having more participants than expected, it would have been beneficial to also test other aspects of the website in this study.

The home page is the landing point and statistically the most visited web page of the library's website. It is the hotspot for students and our university's community to find the catalog, resources to fulfill their research needs, upcoming news and events, the reservation platform, and more. However, as the website redesign progressed, there were challenges in designing the primary components of the website home page, such as assessing what elements were fundamental to have on the library website, following web accessibility requirements, and following the university website's new theme and design. Ultimately, the components of the former library website's home page were migrated in its similar structure to the redesigned

website. Yet, adding questions and tasks on the usability of the library home page and its content components would have certainly aided in not only the redesign and migration, but the direction of the library website's future development. This information will be a focal point for future usability studies of the library's website.

THE FINAL MIGRATION

The greatest challenge throughout the project was the time constraint due to the COVID-19 pandemic. Because the pandemic brought several unforeseen obstacles into staff work schedules, it was challenging to manage the time needed to complete the project and simultaneously work around tasks surfaced by the pandemic. However, staff committed to stay on schedule and to complete the migration project before the start of the fall semester despite the circumstances.

After transitioning to remote library services, emphasis was placed on developing the website and web content. Even more so, the migration project served to ensure that the library was providing an enhanced and accessible desktop and mobile website for users who were now working from home. Additionally, this included the management of web services, on top of the migration project. A concise and organized schedule was necessary and although time management of the different projects and tasks offset by the pandemic was challenging, the web services librarian was fortunate to have support from the library information technology staff.

After the CMS trials and after the website prototype usability study, LibGuides CMS was chosen as the content management system for the university library website. Because the library was looking for an easy-to-use platform, utilizing LibGuides CMS reduced the time needed to build an infrastructure and allowed simple website content management, maintenance, and an improvement over the former website's accessibility and mobile responsiveness. The platform worked well for the campus and the library; however, each library should evaluate its respective department priorities, along with what is expected, desired, and needed for their individual library website to successfully showcase services and programs to users.

Following a modified waterfall model approach proved to be a success for the website migration project due to existing resources and scheduled timeline for implementation. In a future virtual renovation or redesign of the library website, the library will explore various project planning models pertinent to the future proposal's desired outcomes.

ENDNOTES

[1] Isabel Vargas Ochoa, "Navigation Design and Library Terminology," *Information Technology and Libraries* 39, no. 4 (2020).

[2] "Diversity and Equity Data Portal," California State University, Stanislaus, 2021, https://www.csustan.edu/iea/diversity-and-equity-data-portal.

[3] "Quick Facts," California State University, Stanislaus, 2021, https://www.csustan.edu/iea/institutional-data/quick-facts.

[4] Bob Hughes and Roger Ireland, *Project Management for IT-Related Projects,* 3rd edition, (Swindon, UK: BCS Learning and Development, 2019).

[5] Vargas Ochoa, "Navigation Design and Library Terminology."

⁶ Vargas Ochoa, "Navigation Design and Library Terminology."

⁷ "Web Content Accessibility Guidelines (WCAG) 2 Level AAA Conformance," W3C Web Accessibility Initiative (WAI), Web Accessibility Initiative (WAI), 13 July 2020, https://www.w3.org/WAI/WCAG2AAA-Conformance.