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Peer-Reviewed Article

Free for All: Leveraging Remote UX Testing and No-Cost Online Tools for a CMS-based Website Redesign

Victoria Elmwood, *Tulane University*
Elizabeth Kelly, *Louisiana Board of Regents*
Jessica Perry, *Loyola University New Orleans*
William Ransom, *Loyola University New Orleans*
Lucy Rosenbloom, *Xavier University of Louisiana*
Michael Truran, *Loyola University New Orleans*

ABSTRACT

Periodic website redesign projects have become essential -- though often complex and costly -- measures that libraries take to ensure users' ease of access. Though administrators often enlist university web designers or outside contractors for these projects, librarians should be at the center of any library website redesign. This is easier for libraries with employees who have considerable web development-related skills, but it is also within reach for libraries with smaller staff and limited web development skills. Indeed, free UX testing applications, basic office software, and open source or freely available CMSes such as Drupal make library website redesign projects both feasible and affordable., even libraries with limited resources can successfully complete website redesign projects.

KEYWORDS

User experience, web design, libraries

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The work of web design and site construction can be a daunting prospect for library employees at schools with limited financial and human resources. The most effective university websites, however, are often ones that involve librarians as directly as possible in their design because librarians understand the needs of their patrons. Equally important, librarians understand the requirements of the third-party tools (databases and research guides, for instance) that must be integrated into the site. With the benefit of increasingly user-friendly online content management systems (CMSes) as well as a host of other digital tools, even these libraries can create and maintain websites that keep up with contemporary standards of functionality. By using free digital tools and enlisting the help of university web teams (UWTs), librarians at smaller libraries can and should undertake periodic website redesigns to maintain the quality of the service that they offer their communities. Involving library employees in a designated web team and library employees outside of that team is essential for distributing work across a greater number of people while allowing different units in the library greater control over their portion of the site. Unfortunately, creating this level of involvement does not simply happen overnight. Library Web Teams (LWTs) must communicate with the rest of their colleagues about their project by sharing data, creating training opportunities and materials, supporting content creation, and following a maintenance schedule.

We will argue in this article that it is challenging but feasible, even for smaller libraries, to design, build, launch, and maintain their own websites. Indeed, websites designed and maintained at least in part by librarians should be considered part of best practices for optimal library website usability. Armed with basic HTML coding knowledge and a fundamental understanding of how CMSes work, librarians and library employees can work effectively with university web design teams. This partnership is made possible by availability (and usability) of free or open source UX testing applications, basic office software, and open source CMSes to create an easily maintained site.

Literature Review

Leveraging university resources can help libraries with limited funding and technological expertise to complete successful website redesign projects. For example, the University of Denver Libraries worked with the university's Marketing & Communication division (MarComm) to migrate the library website from a "Drupal island" to the university's enterprise CMS, OmniUpdate (OU) (Shea-Tinn Yeh, & Brown, 2014). In that instance, the library approached the collaboration with skepticism that their project would receive the consideration needed because of previous negative experiences with stakeholders outside the library. However, with a process carefully designed to address and mitigate feasibility concerns, librarians ultimately deemed the redesign to have been a success (Shea-Tinn Yeh, & Brown, 2014). Collaboration with university marketing and information technology staff can help alleviate staffing and time issues faced by librarians for whom website design is not a primary job duty. Such joint efforts may even lead to chances for more meaningful interactions with

university staff. However, as these units may not be fully familiar with library services and user needs, they must work closely with librarians and library staff to ensure that the website meets the unique needs of the research community.

Universities with larger technology budgets, or those already engaging in university web design projects, may choose to hire third-party vendors for redesign projects. Libraries may also compensate for their own lack of staffing or expertise by hiring contractors to assist in website redesigns. In doing so, however, they should make sure that library website users' needs are known to the contractor before the work is done. Laster, Stitz, Bove, and Wise detail a case in which the University Libraries at University of Akron hired an outside web developer to redesign the university website's architecture and look, a project that also included the library website (2011). The process focused on marketing to prospective students, parents, and donors rather than current students, faculty, and staff members. Perhaps not surprisingly, this resulted in a site that was confusing to users despite the contactors' efforts to ensure usability through focus group research. Posed with the challenge of redesigning the redesign, the library hired another contractor, one more familiar with nonprofits and academic clients, to conduct usability testing on the new site and redesign its prototypes. Having learned from this experience, librarians at the University of Akron instated a regular regimen of user testing after working with the UX firm to ensure ongoing improvement of the site. In this instance, the differing goals and needs of the university's website versus the goals and needs of the library's website necessitated separate development and testing procedures. Similar to working with other university units, successful collaboration with outside developers necessitates all parties working closely together to make sure that the developers understand the library users' needs and how they might differ from users on the main university website. Failing to do so can be costly, time-consuming, and counterproductive.

To avoid this kind of mismatch, libraries should be as actively involved as possible in designing their own websites. An integral part of this involvement is engaging in UX testing to understand how users navigate the library's resources online. The extent of UX testing that libraries are capable of doing is generally linked to the budgetary and human resources available to them. Larger universities that have more robustly staffed libraries are generally more likely than smaller places to have employees with more than a passing familiarity with web design and user testing best practices. Thus, larger institutions have sometimes been able to conduct testing at several stages in the development process. For example, Dominguez, Hamill, and Brillat (2015), librarians at Florida International University, outline a six-stage process for usability design: discovery, design, development, migration, alpha launch, and beta launch. Though this approach presents a thorough process that sounds sure to produce optimal results, a commitment of this magnitude is usually only practical at a large school with a significant number of library staff with deeper, more focused digital specialties. Additionally, the larger

student bodies at these schools make it easier to recruit a sufficient number and variety of UX testing participants.

In the context of a school with a large FTE, Ohio University librarians were able to conduct card sorting, task-based think alouds, and at least one other approach to UX testing before completing their site redesign. Additionally, they created a plan to deploy usability testing software, including heat mapping applications, to help maintain the site in the future (Tomeo, 2012). Another sizeable school, Texas Tech, was able to conduct multi-stage, multi-modality testing that included librarian focus groups, patron surveys, and, in a round of follow-up testing, assessment using Google Analytics (Barba, Cassidy, De Leon, and Williams, 2013).

Some librarian-designers at larger schools have focused their accounts on conducting and reporting a thorough set of tests performed at one single stage within the longer development process. Utah State University librarians' account tells of a conscientiously organized and executed card sort that involved librarians, faculty, and graduate students in multiple rounds of testing that incorporated both open and closed sorts as well as additional feedback at each round. Librarians not on the development team were also allowed to comment on the proposed site architecture that resulted from the insights derived through the card sorting (Sundt and Eastman, 2019). By involving the entire library staff, the redesign team collected feedback from a variety of perspectives, integrating, for example, the needs of systems librarians with those of instruction librarians.

Smaller or less well-resourced schools, on the other hand, must be creative in both the variety and frequency of testing that they conduct. Hunter College, a larger but moderately priced CUNY branch campus, focused user testing on multiple rounds of card sorting that included open and closed sorts followed by a survey with constructed and free response feedback (Becker and Yanotta, 2013). In some cases, these libraries may not have the capacity to undertake commonly accepted UX testing methods. Adeyinka (2019), a librarian and instructor for web design at both the University of Ilorin and Kwana State University Malete, relied primarily on a more generalized Likert scale survey that asked users to rate their existing site based on overall satisfaction, presence or absence of certain features, and a desire for added functionality. Statistical data derived from these surveys guided the redesign of this library's site, while also confirming that users liked and used many of the site's existing features. Another institution facing significant limitations in resources, Hillsborough Community College inventively used feedback about the site gathered during an external program review to direct their redesign (Bullian and Ellison, 2019). Vargas Ochoa (2020) at Cal State Stanislaus (a modestly priced, mid-sized branch campus), focused on think-alouds and post-test interviews as the primary modality of UX testing for that library's site redesign. Somewhat differently, at the small, mid-range cost institution of Mount Saint Vincent University in Halifax, Nova Scotia, Gillis (2017) relates UX testing trials that used a couple different methods to home in on a single focus: diction and the use of jargon on the existing library site.

Thus, robust, multi-stage, multi-modality UX testing for library website redesigns requires significantly greater resources in terms of specialization and time as well as a larger population of students and faculty to optimally draw from for potential test subjects. Libraries at smaller schools or schools with fewer resources to spare must generally sacrifice thoroughness and time in their testing. To boot, these libraries must be creative not only in terms of the UX testing in which they choose to invest but also in terms of their employees' technical capabilities regarding web development. Though library employees are generally eager to acquire and build these skills, finding the time to actively learn even modest web design using a CMS can be a challenge for workers already wearing many different hats.

Teaming up with outside units and using open source CMSes has been a fruitful alternative approach for libraries that may have resource limitations or may be reacting to other institutional politics. Despite being part of a mid-sized private school and having an accordingly staffed library, librarians at the University of Denver (Yeh & Brown, 2014) had to contend with pressure to participate in university-wide digital recruitment efforts. They had success, however, working with the university's Marketing and Communications office. University web developers consulted the existing site's analytics and conducted a card sort with library faculty to create a site that librarians beta tested before going live to the broader university community (138-39).

A recent redesign project at Colgate University took a more independent approach in which a small team of librarians reworked a static, Dreamweaver site and changed information architecture while also shifting the site's platform to Drupal (Buell & Sandford, 2018). Here, pre-dev surveys and other UX testing of faculty, students, and staff assessed stakeholder needs while a post-development round of testing showed overwhelming preference for the new site. Despite not being web designers themselves, librarians collaborated with IT staff enabled librarians to ensure that crucial functionality of the old site was not lost in the redesign (124). Moreover, the shift to a user-friendly CMS allowed librarian-designers to implement a model in which all library employees were given limited editing privileges (123).

Our Approach

Our own library's process closely resembled the process that Buell and Sandford describe for their redesign at Colgate University, from the frustration with multiple employees editing and maintaining separate static sites for desktop and mobile (119-20) to the extremely low cost of the redesign (121). We were also moving to a CMS from a static site and opening content creation responsibilities to a larger number of our staff. For libraries that lack both funding and employees with any background in web development, limited but well-conceived and implemented UX testing paired with support from experienced university developers will be crucial to a successful redesign effort. Libraries dealing with significant budgetary constraints should also take care when choosing from open source or free options for a CMS (WordPress, Drupal, etc.). Though the limitations in resources and employee specialization may have many

root causes, the time-honored assertions of UX gurus such as Jakob Nielsen that even limited, small-scale testing has great value continues to be supported in the recent literature related to library website design and UX testing.

Considering the overwhelming range of different kinds of UX testing, we chose card sorting as the primary testing modality for a couple different reasons. First, this kind of testing does not require a beta site or even wireframes of any sort. Indeed, the power of card sorting to yield insights that determine information architecture for a new site makes it especially practical to do this kind of testing very early in the process. Second, we found several highly usable digital card sorting apps that made the difficult work of scheduling testing sessions unnecessary. Other free resources such as Tableau, GSuite, Google Analytics, and, of course, Drupal's open-source CMS helped us with other parts of the redesign project. This widespread availability of freely available or open-source tools puts both UX testing and new site construction within the grasp of the smaller college or university library.

Beyond conducting a couple rounds of modest testing and analysis to inform our design process, we also leveraged the practice of reporting this testing and analysis to our colleagues to create ongoing relationships with them throughout the new site's design and development. UX studies often leave out the impact that internal organizational relationships can have on maintaining a new site, particularly if many employees serve as content creators who need periodic training on the new CMS. We, the Library Web Team (LWT) at a Catholic university in the South, were able to make major decisions about site design and development without constraints from administrators thanks to the data provided by just a couple rounds of modest UX testing. Because of this, we also bore responsibility for keeping colleagues informed, allowing space for feedback, and training the colleagues who would oversee creating site content for the library's different internal units.

Below, we will outline the different stages of our website redesign to highlight our use of free software, systems, and applications. We will focus first on the impact that our UX testing and data analysis efforts had on our CMS-based redesign of the library's old, static website. Next, we describe how our outreach to library colleagues outside of the LWT grew directly out of our UX testing stage. Specifically, we outline a progression from information sharing and consensus building to content editor training. From there, we then describe our pivot from training content editors on Drupal CMS to educating them about ongoing planned site maintenance.

Institutional Context

Our institution is a private university in the South with an enrollment of just under 5,000 students. The university comprises six academic colleges (Arts and Sciences, Business, Nursing and Counseling, for instance), of which the library is one. It employs between 15 and 20 staff and faculty members with diverse and multifaceted job duties. One of the core teams in the

library is the Library Web Team (LWT), which includes faculty and staff from areas that include library instruction, systems, information resources, and special collections and archives. The six members of LWT have varying web design and development skills and training and are primarily self-taught. No member of LWT has explicit web design responsibilities as part of their job descriptions with the exception of the Digital Programs Coordinator, who leads the LWT and acts as project manager. LWT meets on a biweekly basis to review ongoing issues with the website as well as to develop ongoing assessment and improvement projects.

History of the Library Website

Our library's first website was built by a single librarian in 1996. In the ensuing 30 years, the library continued to maintain its own static, File Transfer Protocol (FTP) based website even as the university built its own site and formed a University Web Team (UWT) made up of professional web developers and designers. By the mid-2010s the library website was severely outdated and increasingly difficult to maintain. Staffing shortages and job description changes in the library led to fewer staff and faculty with the skills needed to serve on LWT, and even those who were able to work on the site were constantly pulled in other directions and unable to keep up with minor edits much less major redesign projects. The site required that LWT members use an FTP application to upload edited web pages to an on-campus server, requiring that changes to the existing website either occurred from on campus or by VPN, and limited access and licenses to the VPN often made this difficult or impossible. Further complicating website maintenance was the library maintenance of separate websites for mobile and desktop devices, which necessitated replicating updates to two separate sites. Finally, with a rapidly shrinking LWT, keeping up with the volume of content changes on the website was no longer tenable, and the existing model of LWT being the only library staff and faculty with the ability to make even minor editorial changes to the site had led to a website that was outdated in terms of functionality, design, and information content.

By 2015, UWT had begun migrating the university website to Drupal, an open-source content management system (CMS) that has become a standard platform through which to run dynamic library websites in higher education. Indeed, between 2012 and 2017, university libraries' reliance on CMSes – specifically open source CMSes – doubled (Comeaux 2017, p. 11). (Interestingly, however, Williamson et al reported in 2021 that librarians at the University of Idaho have recently bucked national trends by switching to a static site.) Opting for the more popular CMS option, LWT hoped that a migration from a static to a dynamic platform would ensure improved responsive design functionality, allow easier editing from off campus by a larger number of content editors, and improve accessibility of the site. Unfortunately, university-wide budget cuts, a wave of staffing changes, and a hiring freeze disrupted LWT's plans, and the project was temporarily sidelined.

Project Initiation and Planning

In 2017, refreshed and regrouped, LWT revisited the idea of redesigning the website and using a CMS, and the project was begun. Following the best practices that the team previously researched, the following outline was developed:

- Define project: Redesign library website to (1) better meet user needs and (2) distribute content creation across the library.
- Identify stakeholders: Consider demographics within the university's undergraduate and graduate students (online and in-person), faculty, and staff; library student workers, faculty, and staff; alumni; community members; state and national-level consortia.
- Identify responsibilities and decision-making power within the redesign team: Create three overlapping groups (Project Management, Architecture Team, and Design Collective).

LWT was not given a budget for the project, so from the beginning the intent was to build the redesigned website with few to no additional costs beyond minimal internal training resources. One of the best practices that LWT uncovered in our research was that the redesign should occur on a strict and accelerated timeline, preferably around one calendar year. However, the decision to use an already-overtaxed UWT's expertise and existing infrastructure, plus the limited time available to LWT members to work on the redesign, made this impossible from the get-go. Ultimately, from planning to launch, the redesign took three years to complete.

UX Testing

Going into this project with a site that had been in place for almost a decade, we had some hunches about parts of the site that were not being used, but we wanted to get a full picture of the site's size and scope. While we inventoried the site to help with considering CMS possibilities, we also looked for ways to find insight as to how our users were interacting with the site. Large schools report the benefits of looking at web analytics (Barba, Cassidy, de Leon, & Williams, 2013; Vecchione, Brown, Allen, & Bachsnagel, 2016), and smaller libraries should also consider this as a logical, cost-neutral first step for any redesign effort. After we looked at selected site metrics using Google Analytics (GA), we found some trends that were unsurprising, such as the times of day and year incurring the heaviest traffic. On the other hand, we found other, surprising patterns that helped us understand what our new site needed to emphasize. For instance, the bounce rate from the home page was greater than expected, and a noticeable number of users were struggling to log in through our proxy server, a phenomenon confirmed by the library's login error logs. Equally important, we identified features on our site that were heavily used (databases and login help) as well as those that were not being used (our Quick Links box and our blog). Though the analytics for a site can be complex and difficult for novices to process, library employees looking to them for basic insights can benefit from simple metrics

such as the top ten most visited sites, diagrams showing common pathways that users follow as they navigate a site, and the amount of time spent on specific pages. There are some key discoveries to be made about how users interact with the site, even if web teams only consider top-level, broader metrics such as these.

To guide our redesign, we chose to focus on piecing together a holistic picture of how users conceptualized information on the existing site. Developing this kind of understanding was critical to building a new, better, site from the ground up. After surveying the different, standard types of UX testing commonly used, we chose card sorting in order to find how our users' shared mental models impacted their information-seeking process. As discussed above, much of the literature on UX testing from the past decade has focused on task-driven talk-aloud protocols, which highlight fail points and other places where users struggle to complete tasks. While this knowledge is useful for making targeted changes to an existing website, it does not provide insights that directly suggest a schema for a new site's information architecture. By knowing the categories and implicit interconnections between those categories that users have in mind when they look for information on our site, we can structure the site to make it easier for them to find these pieces of information. If there is only one round of testing that a library can do as it plans a complete site redesign, card sorting is, we suggest, the UX testing protocol is the most useful because it tells designers what the underlying information architecture (IA) of the site should be. To put it somewhat differently, other UX testing modalities will identify discrete fail points of a site, but card sorting is the only kind of UX testing that suggests how an entire site should be organized to optimize usability.

While card sorting activities have often been done in a face-to-face context (Sundt & Eastman, 2019), the schedules and workloads of our library employees and users made the prospect of scheduling test sessions a daunting one. Not only this, but due to severely limited fiscal straits, we also had no incentives with which to recruit test subjects. Understandably, then, we wanted to remove scheduling concerns as a barrier to participation in the card sort activity. By making the activity something participants could do anywhere and anytime, we hoped to recruit enough participants from several different user groups to collect adequately representative feedback. In the absence of gift cards or even snacks to help entice participation, we relied entirely on our librarian liaisons to recruit different types of students (undergraduate students, online students, and graduate students), faculty, and staff to take part in our card sort. Though alumni and consortium users lay within the umbrella of our user population, they were not our primary target groups and were thus not included in the demographics we targeted for UX testing. Fortunately, our subject liaisons were able to recruit a pool of UX testing subjects in which each target user group was represented. Working within the limitations of the free version of OptimalSort at the time – only 10 subjects and 30 cards per study, but with unlimited studies – we created a separate study for each demographic group. (Unfortunately, OptimalSort has since scaled back the number of active studies it allows with the free version to just one study.)

We recruited between four and six subjects from each group. In the end, our pool of subjects included one graduate student (who was enrolled in a fully online program), three undergraduate students, three staff, and four faculty members. A few respondents chose to only complete the card sort and declined the opportunity to leave free response feedback via the accompanying Google Form. For libraries lacking existing strong interpersonal relationships between subject liaisons and all types of users, an LWT could recruit test subjects in person in the library lobby, at library-related events, or even select classes.

Once we had obtained IRB approval and received signed releases from users, we emailed participants a link to the remote card sort as well as the link to a Google Forms follow-up survey that we directed participants to fill out after completing the sorting activity. A worthwhile extra step, our follow-up survey yielded valuable information, such as users' aversion to sites organized by user profile (organized for use by students vs. use by instructors).

The card sort itself and the statistical analysis that came with the online application we chose showed some clear, overwhelming trends in how users sorted and categorized pieces of information. For libraries involved in a complete redesign, we suggest that open card sorts are best because they ask users to put names to the categories into which they sort cards. For libraries making more modest structural changes to an existing website, however, a closed card sort that asks participants to sort cards into a set of a few predetermined categories would be both more useful and more feasible. Alternatively, A/B testing and talk-alouds may be more useful in these cases as they allow testers to isolate their focus to a smaller portion of a website.

Though we noticed mainly cosmetic differences between many online card sorting programs, we found OptimalSort, a part of Optimal Workshop's UX research platform, to be the cloud-based application best suited for our needs. Other free virtual sorting platforms are available (for example, xSort, usabiliTEST, and kardSort), and most have very similar virtual card interfaces but different levels of data analysis that come with the free versions. Significantly, none of our participants reported problems with using OptimalSort. Though the free version did not allow us to include survey questions following the sort activity, we were able to use a Google Form to collect post-sort feedback.

OptimalSort provided automated data analysis of our card sort that consisted of data visualizations of the ways that participants had sorted cards and labeled their categories. Three of these renderings were especially useful to us: a virtual representation of category names and item groupings organized by type of user, a similarity matrix identifying cards commonly sorted into the same group, and a dendrogram showing common groupings of items. These graphs helped us to see meaningful user trends that were not at all obvious from simply looking at each participant's category names and contents. Trends were hard to identify decisively without the help of data visualization because there were many different ways that participants sorted and categorized content cards. As we had hoped, the raw sorting results showed us the broad

categorizing logic people used to group items as well as their preferred terminology for those categories. At a more granular level, the similarity matrix graph identified individual cards that our users consistently grouped together. Finally, OptimalSort's dendrogram isolated clusters of cards with high levels of agreement, which helped us merge closely related groups and ignore outliers.

By looking at the categories that contained the most consistent clusters, we were able to settle on a top-level menu that included Resources, People, Places, and About. (The separate People and Places tabs were later merged because a very small amount of content appeared under the People tab, content that dovetailed well with information located under the Places tab.) Participants also liked "Services" but did not consistently sort cards into this category, so we decided against creating a menu tab with that heading. In the post card-sort survey, our participants mentioned that they disliked what Vargas-Ochoa (2020) refers to as audience-based design, in which a site's information architecture is arranged according to user profiles (student vs. faculty, for instance) rather than a category-based schema. Having qualitative data to back up this particular disinclination was valuable because part of our existing website had been configured using this approach despite LWT's reservations about its effectiveness.

The Google Form survey that users completed after the card sort provided us with useful, more qualitative (and sometimes affective) information. It solicited additional information about the activity, asking participants to highlight cards that were difficult to understand and to identify additional cards they would have wanted to include. It also asked participants about their experiences with the existing website, including frequency of site use, main purposes for visiting, and difficulties with use. Most subjects filled out the survey, but a few in underrepresented categories such as online students and graduate students only completed the card sort portion of the activity, suggesting one limitation of virtual testing. Though the presence of librarians to coach users through in-person testing could have resulted in a greater level of participation across groups, this approach would still not have been usable with online students.

While the survey results did not tell us much about our users' conceptual frameworks, they did tell us which things they cared about most. For example, in addition to information resources, users mentioned services such as room reservations, equipment checkouts, and interlibrary loan. They also noted being confused by library jargon on the site, namely the term "learning commons," and by mentions of library instruction. There were also cases of statistical noise: complaints about the university website or about services located on third-party sites that were beyond our control. This noise reminded us that our users experience the site as an integrated whole rather than as a container housing several different vendors' products (research guides, databases, and the library catalog, for instance). Though this realization did not change the way we organized the new site, we did communicate it to our colleagues in case it could help with troubleshooting or even research instruction.

Not only were the data from the card sort and survey useful for the web team's own decision making, but they were also useful in helping us explain major IA choices to the website's stakeholders. Web design professionals such as Laura Solomon stress the importance of having data to back up design choices as crucial to ensuring that the institutional politics that often accompany redesigns do not hamper the effectiveness of the revamped sites (7). We experienced limited objections about the site's structure because we made data-driven decisions based on our UX testing. These studies were especially valuable for helping us to convert resistance into support of key IA features. Card sorting and survey results also helped us agree on the naming and grouping of items nested within subcategories.

Different kinds of remote testing would have been possible for us to conduct during the pandemic thanks to our users' growing comfort with videoconferencing applications. Indeed, some studies report success with this (Resau, 2021), but the chaos of the pandemic forced us to focus solely on learning the CMS and actually building the site. We had also discussed the possibility of A/B testing before launching the new site, but we were unable to commit to the amount of work that creating a second site would have required. While some librarians describe redesign efforts that have begun with a user survey (Desmarais & Louderback, 2020, p. 969), we integrated a user survey following a monthlong soft launch of the redesigned prototype.

The approach we chose -- a simple survey displayed on the new site during a highly publicized two-week soft launch period -- resulted in 96 responses that came from a broad set of user types. Considering that the soft launch took place in the middle of the summer months, this level of response showed great interest on the part of our user base. The respondents included a surprisingly healthy mix of the site's different user groups, particularly considering that it was conducted during the summer months, when the academic world is often at its least responsive. We contacted multiple listservs, campus email newsletters, and placed a link to the survey on the new site. As a result, we recorded responses from 43 undergraduates, seven graduates, 28 faculty, 15 staff, and three miscellaneous write-ins. The usefulness of the data we collected confirmed what we had seen in our research, namely that we could benefit from non-UX testing modalities when looking for insights about user preferences (Adeyinka, 2019; Bullian & Ellison, 2013).

These responses prompted us to make several small but high-impact changes to the prototype site, including revisions to graphic styling, more meaningful language in labels and menus, and the addition of links to frequently used pages just below the site's main search box. We also used it as an occasion to collect data on device type and browsers that our users were relying on to access the site, information that may help inform future UX work but that also helps us with everyday troubleshooting. Copious positive feedback, again, helped to create support both inside the library and within the university community. Communicating the results of the survey, for example, created an occasion that allowed us to credit and thank our library colleagues for contributing their own efforts to building parts of the new site. This

communication dovetailed into ongoing connections between the LWT and content editors outside of the LWT. Below, we will discuss three activities essential to establishing a strong team of competent content editors outside of the LWT: communications, training, and site maintenance. Following this section, we will briefly describe the extent to which the LWT used no cost and open software and resources to offer concrete suggestions for other libraries considering this approach.

Institutional Processes

Communications

Because one of our project goals was to distribute the work of some content creation among colleagues who were not on the LWT, we worked to create buy-in among our coworkers throughout the project's duration. The switch to a CMS, while it would give everyone more control over their content on the site, also meant that we were asking people to take on additional work. To offset this demand, we strove to communicate clearly about the project at each of its stages so that everyone felt involved and informed. We held annual library events (which we playfully called "hootenannies") at which we shared information, demonstrated how to plan and create different kinds of content for the site, and communicated best practices on writing for the web. These events were, whenever possible, included in the agendas of all-library meetings, enabling us to maximize our reach to our coworkers without burdening them with extra meetings. As progress on the project often moved at a slow pace, these periodic conversations gave at least some small sense that the project was making progress, nonetheless.

At the 2018 hootenanny we announced the launch of the website redesign project. Our agenda included sharing the Gantt chart timeline, displaying initial landing page mock-ups, and asking our colleagues to take part in a card sorting activity. By the following hootenanny, in 2019, LWT had completed its card sort within the university community and had gotten access to a blank shell of the site from UWT. We shared insights from the card sort and survey, showed sample pages and an updated potential landing page mockup, introduced a style guide, and led an activity to help content editors practice writing effectively for the web. Finally, at the 2020 hootenanny, LWT had a test site created that allowed our colleagues to get in through the back end to see what the CMS looked like and how to fill out the information required for different types of components on a given page. At this final hootenanny, we also covered basic terminology required to navigate Drupal, walked through the process of logging in, adding and editing pages, and gave everyone time to play around on the test site while LWT members circulated throughout the room answering questions and troubleshooting.

These hootenanny events, each tailored according to the project's progress, encouraged engagement and feedback from our colleagues at every step. If we had been able to stick to our original, more ambitious completion schedule, our content editors might have felt greater continuity with the project. However, given the speed at which the project moved forward, we

felt the need to take time at the beginning of each event to remind our colleagues of where we were in the project as well as of our revised date of completion. Though the UWT's use of a somewhat disappointing contractor delayed us in getting our own blank copy of the site, we were still able to provide significant details to our peers in the library about the project's trajectory and our plans to move forward.

While we wanted library-wide involvement, we also needed to be conscious that many colleagues were not able to take on the additional work of learning how to create and of maintaining web pages. Our approach to recruiting a small number of content editors was first to create content editor accounts for almost everyone but then to work closely with a few who had expressed interest in the project. The goal was to find at least one colleague in each department who could manage the content in their areas in the ways that made the most sense for the department's workload and individual employees' technological capabilities. At the same time, we also offered to have LWT maintain pages for people who had a clear stake in the content and appearance of their area's page but who could not do it on their own. Based on job titles and responsibilities as well as some individuals' expressed interest, we identified content creators for each page in our site architecture, assigning different pages to different colleagues using our IA spreadsheet. Each page also had an LWT member assigned to it on the spreadsheet. That LWT member was responsible for reaching out individually to non-LWT members to provide training and assistance in revising content.

Our main approach for creating content was to break the work into two steps: drafting the content outside of the CMS and then working on the design of the pages using Drupal's various content types (accordions, news items/events, feeds, employee profiles, content cards, and button arrays, to name a few). Recognizing that different colleagues had differing levels of comfort with web design, the one-on-one pairing of content editor and LWT partner enabled each pair to establish a workflow and level of accountability that suited them. In some cases, LWT partners built pages entirely using content that their colleague had written in a Google Doc, but other colleagues were keen to teach themselves and took more independent roles in their pages' design and contents.

Training

After the site launch in June 2020, we wanted to continue to offer training opportunities for content editors without the worry of scheduling large meetings that many of our colleagues could not attend due to a shrinking staff and increasingly busy schedules. After we launched the new site, we all understandably felt less of a sense of urgency surrounding the project, but we also wanted to keep the basics of using Drupal from falling to the wayside. Our solution was to create a Drupal Content Editors LibGuide for non-LWT content editors that would contain both refreshers for basic information and a growing repository of additional training presentations that we could add to over time. The section on basic information includes simple step-by-step

instructions for basic page creation and editing, accessibility guidelines, and a glossary of content types and components, as well as links to external tools such as a library style guide and an accessibility checker. We have also included reminders about what levels of permissions content editors have in Drupal and encouraged them to contact LWT with questions or requests.

To provide ongoing training opportunities, we have been hosting occasional drop-in events, each anchored around a specific lesson such as how to create a news item or an introduction to the basics of web accessibility. Held over Zoom due to the pandemic, these events were recorded and archived on our Drupal LibGuide for future reference and are used by coworkers who were unable to attend trainings or who have forgotten how to create certain content types. We have also labeled videos with external timestamps to help our colleagues locate individual topics within each video more easily rather than requiring them to search through an hour-long video for a specific topic. This setup ensures a high level of usability for these training and documentation materials. We anticipate continuing to offer training sessions driven by questions from content editors and by discoveries that we make about new useful capabilities in future iterations of Drupal.

Scheduled Site Maintenance

Our site launch also included a plan for prescribed maintenance issues. We first identified areas that would require ongoing attention: ensuring consistency with the university and library style guides, updating resumes and CVs, confirming accuracy of contact information, checking accessibility, identifying and fixing broken links, examining site statistics using GA, periodically verifying policies, and cleaning up news/event listings. To ensure these maintenance tasks stay on our radar, we created a monthly maintenance calendar that LWT revisits at each of its biweekly meetings. A few of the tasks make sense to update at certain times of the year. For example, faculty often update their CVs at the beginning of each semester, so we assigned this task to September and February. Similarly, cleaning up old news and event listings is most practical to save until the end of the school year. Concerns such as accessibility checking and fixes sometimes take a bit more time while style guides have proven difficult, if not impossible, to enforce. Consequently, we have found it helpful to be flexible about having realistic expectations for maintenance timelines.

By using a monthly calendar, we break up the large task of keeping the site up to date into regular, manageable tasks to make sure that maintenance continues as an ongoing consideration. The calendar also creates a cycle that prompts us to reach out to our colleagues who might need assistance in these tasks. As a result, content editors are becoming more accustomed to receiving an email highlighting the month's focus, rather than sporadic, unexpected notifications. While some of the maintenance tasks (such as checking GA trends) are largely internal to LWT, we sometimes must communicate with individual content editors to recommend changes to their existing pages. This has been particularly challenging, as noted

above, with questions of accessibility and style. In these cases, we have chosen to proceed slowly by first doing general outreach, including providing training or education surrounding the issues in question. Once we have given all our content editors the knowledge and guidance, we then follow up with one-on-one outreach in which we offer support to individual content editors. This has not always been a successful approach, however, and we have had to accept less control over website content as a drawback of opening up website content and maintenance to a larger group.

Using No-Cost and Open-Source Tools

Due to the lack of a budget, we took advantage of free tools for project management, user testing, training, deployment, and assessment. At the most global level, Tableau's free Gantt chart maker helped us plan and revise completion dates for the entire redesign process so that we could stay on track with multiple simultaneous tasks. Though we found ourselves moving our completion dates back time and time again, we were gratified by being able to mark particular tasks as done or at least as being in process. In any project of this size and duration, celebrating small successes and task completion helped us maintain investment in the project while also rewarding work well done. Tableau's capabilities were more than enough to handle our project, but graphics applications such as Canva also offer options for easily charting progress during the project.

Beyond planning the stages of the project and keeping track of progress, we also incorporated tools that offered free versions or to which we already had paid access through an existing university account. Two key online applications that we were able to use for no added cost, GSuite and OptimalSort, helped us conduct simple yet effective card sorting that was 100% remote. We used Google Sheets, part of our institutional GSuite package, to build a spreadsheet that articulated the new site's IA (one spreadsheet per top-level menu option). This same spreadsheet served the double purpose of assigning responsibility for portions of the site and of tracking our ongoing creation of the new site's content. Equally important, this spreadsheet also allowed us to pair LWT members with non-LWT library employees to make sure they had help in composing each page of new content. As both LWT and non-LWT members created content for the new site using shared Google Docs, GSuite provided the essential shared online repository space for all files involved in the redesign process, including spreadsheets and wireframes. For those who have ethical reservations about dependence on Google or Microsoft, Open Office applications will also work for these purposes. There are also several different free shared cloud space storage services to use for collaboration, including Blomp and Degoo, though we cannot speak to their quality or ease of use.

Our choice of CMS to replace the existing hand-coded Dreamweaver site was a pivotal point in the project. The two candidates were Springshare's LibGuides CMS and Drupal. LibGuides' CMS came with a moderate cost, offered extensive support, and had a familiar back-end interface. However, we saw its limited design and content type options in other library sites

built with the CMS that we encountered. Drupal, by contrast, was free and open source, and it was the CMS already being used by the University Web Team (UWT). Though Springshare's product would have been quick and easy to use, especially given our familiarity with building LibGuides, its cost made it impractical for us as both Drupal and Springshare products offered all the functionality we needed for the new site. For smaller libraries whose employees lack the time or necessary skills, LibGuides' CMS seems like a feasible option, however, its cost suggests that it may be an added budgetary burden that would require regular budgetary allocation year after year.

Throughout the rest of the redesign, we also used free or open-source tools, helped by many of the Drupal 8 support materials available online and by the UWT. The ready availability of online resources for Drupal 8 helped us master basic terminology and understand how to choose the appropriate components to effectively display the information that each page contained. Drupal's vigorous user-developer community and its well-documented capabilities often provided answers to basic questions we had about using new content types or how to integrate them effectively into the new site. We initially looked into getting help from Drupal design and site management intermediaries such as Pantheon and Acquia, but our lack of a budget made it more practical and realistic to work with the UWT. Because UWT was as short on human resources as we were, they were happy to hear that we wanted to design, build, and maintain our own website using a copy of the university site's basic shell as a starting point. We can recommend that other university libraries in this situation reach out and initiate discussions about the degree of collaboration and support they can ask from their own institutions' UWTs, whether those are housed in IT departments, marketing and communications, or elsewhere. Our discussions with the UWT often saved us time as the university developers could tell us whether the options we were considering for the site would be feasible.

Happily, the working relationship that LWT developed with our university's two-member UWT has continued to be a successful and supportive one. In cases where LWT is unable to find instructions online for how to accomplish something using Drupal, UWT takes time out of its busy schedule to lend us the guidance or help we need. It can sometimes take a while as our UWT is extremely overburdened as it is, but they have always supported us. Even more helpful, one UWT member hosts monthly Drupal training sessions that also function as Q&As for units on campus that manage their own webpages on the university's site. To date, they have taught us things such as how to create emergency banners for use during events such as hurricanes and how to create, delete, and update employee profiles that are synced with the university website's contents. When working with UWTs, other libraries will also want to inquire about existing training materials for the CMS, particularly at institutions where employees within different units or departments maintain their unit's portion of the university website.

Finally, in preparation for and again following the official launch of the website, we looked to free tools to enable us to make sure the website was accessible for all users. Section

504 of the Rehabilitation Act of 1973 requires that organizations who receive federal funding may not discriminate against users with disabilities; this extends to university and college websites. In addition, it was important to LWT to ensure that the site was usable for all regardless of the federal mandate. We utilized Dead Link Checker to find links that were not working and manually replaced them. We used the free WAVE (Web Accessibility Evaluation Tool) to find accessibility and Web Content Accessibility Guideline (WCAG) problems by manually checking every page on the website. WAVE categorizes its findings into six areas: Errors, Contrast Errors, Alerts, Features, Structural Elements, and ARIA. Errors and Contrast Errors indicate elements that do not meet WCAG standards and could make the page unusable. Alerts indicate elements that could be problematic; these must be further evaluated to determine if they are errors or could otherwise affect the accessibility of the page. Features are elements that could be useful for accessibility if used correctly and should be double-checked. Structural elements show the architecture of the page, and ARIA denotes where Accessible Rich Internet Applications (ARIA) elements, which like features can be useful for accessibility, if used correctly. For the site launch, we used Google Sheets to track Errors, Contrast Errors, and Alerts found by WAVE. We fixed all errors and notified UWT of Contrast Errors in the overarching CSS that we did not have the ability to edit ourselves. We also assessed and addressed Alerts, but in doing so found some elements that, while not outright accessibility errors, were non-optimal. We discovered that working with content editors to address some of these issues proved more challenging than we anticipated, as they were often less than concerned with issues uncovered by alerts if they were already pleased with the visual design of the page (for example, using tables for layout purposes rather than to organize data). We found that, in these instances, it was necessary to meet with the content editors one-on-one to discuss the issues and possible solutions that would resolve any potential accessibility problems while still accomplishing their goals.

Finding freely available, yet still effective tools to complete the site redesign was not as difficult as we had anticipated. Indeed, we were pleasantly surprised by the number and quality of the options we were able to use, as well their overall user friendliness. On a somewhat different tack, the interpersonal work of winning over and involving a significant number of library employees in writing and building new digital space for our content was almost as vital.

Conclusion

University library websites can and should be built and maintained by university library employees, even when human and financial resources are scarce. As librarians, we understand the third-party services that need to be integrated into our sites, and we know our users' basic informational needs better than web developers and higher education marketing staff. Thus, library website redesigns are best served by a redesign committee made up of library workers. Strong communication and feedback opportunities throughout the redesign process can generate buy-in among future key users and improve the overall quality of the finished product.

Sharing lower-level permissions for site editing with selected colleagues helps keep the website up to date in terms of policies, services, access to information resources, and promotion of events or trials. Such an expansion of editing permissions requires recruitment among stakeholders at the beginning of the redesign project as well as regular outreach work and training both during and after the project, but the benefits of this approach by far outweigh the drawbacks. Though some libraries may lack employees with deep knowledge about web design and administration, they can tap IT or web development units within their universities to help with setting up the basic infrastructure of a site. Freely available resources for site use analysis, UX testing, and content management make our particular LWT's arrangement one that can be replicated elsewhere, even for libraries with small staffs and tighter-than-usual budgets. A core team of library employees can undertake the work of analyzing the existing site and conducting modest user testing, and additional library employees placed throughout the organization should be involved in learning to create and maintain content.

In our experience, maintaining clear communications by reporting results of the UX analysis and design phase for our new website helped to set a foundation to train non-LWT members in content creation using the site's CMS. We leveraged this communication to solicit deeper involvement from colleagues interested in learning how to manage their own parts of the site. In our case, this promise was enough to encourage several colleagues to build or at least help plan new content during the redesign. As a result of this collaboration, the library employees who are not on the LWT have felt increased ownership of the site and have successfully maintained their unit's portion of the site after it was launched.

Communication with and training of colleagues should cover more than simply the how-to's of building content, such as creating employee profiles or event announcements. It should also include best practices guidelines for creating web content, including accessibility. That is to say, teams should encourage content creators to adopt practices such as avoiding complex sentences and using bullets to convey information in easily digestible bites. They should also build awareness about known accessibility standards for web content in their training, for instance, the appropriate use of link text or proper annotation of external links or linked files. Not only will this make the site usable to a population that faces significant challenges to accessing information online, but it will increase usability without the resource-intensive user testing that often precedes site improvements.

Libraries at more robustly resourced institutions are often able to follow more elaborate, time- and labor-intensive procedures related to UX testing, design, and maintenance when building their own websites. However, libraries with fewer resources can make use of their existing human resources and freely available digital tools to complete website redesign projects of their own. By using these tools, enlisting colleagues' help as content creators, and providing robust support for throughout the rebuild and the subsequent maintenance of the new site,

small but devoted teams of librarians and library staff can redesign and rebuild a new website that provides improved service to their user communities.

No-Cost and Open-Source Tools

Dead Link Checker: https://www.deadlinkchecker.com

WAVE Web Accessibility Editor: https://wave.webaim.org

W3C 3.0 (most recent – July 2023): https://www.w3.org/TR/wcag-3.0/

WebAIM Contrast Checker: https://webaim.org/resources/contrastchecker/

GSuite: https://workspace.google.com/

Drupal: https://www.drupal.org/

OptimalSort: https://www.optimalworkshop.com/optimalsort/

Canva: https://www.canva.com/

XSort (Mac only): https://xsortapp.com/

kardSort: https://kardsort.com/

References

Adeyinka, T. (2019). Empirical analysis of undergraduates' satisfaction with access to the university websites. *Journal of Access Services,* 16(2-3), 94-115. http://dx.doi.org/10.1080/15367967.2019.1639511

Barba, I., Cassidy, R., De Leon, E., & Williams, B. J. (2013). Web analytics reveal user behavior: TTU Libraries' experience with Google Analytics. *Journal of Web Librarianship, 7*(4), 389–400. https://doi.org/10.1080/19322909.2013.828991

Becker, D. A., & Yannotta, L. (2013). Modeling a library website redesign process: Developing a user-centered website through usability testing. *Information Technology & Libraries*, *32*(1), 6–22.

Buell, J., & Sandford, M. (2018). From Dreamweaver to Drupal: A university library website case study. *Information Technology & Libraries, 37*(2), 118–126. https://doi.org/10.6017/ital.v37i2.10113

Bullian, J., & Ellison, A. (2013). Building a low-cost, low-labor library web site at Hillsborough Community College. *Journal of Web Librarianship*, *7*(3), 333–342. https://doi.org/10.1080/19322909.2013.810080

Comeaux. (2017). Web design trends in academic libraries—A longitudinal study. *Journal of Web Librarianship*, *11*(1), 1–15. https://doi.org/10.1080/19322909.2016.1230031

Desmarais, & Louderback, P. (2020). Planning and assessing patron experience and needs for an academic library website. *Journal of Library Administration, 60*(8), 966–977. https://doi.org/10.1080/01930826.2020.1820283

Dominguez, G., Hammill, S. J., & Brillat, A. I. (2015). Toward a usable academic library web site: A case study of tried and tested usability practices. *Journal of Web Librarianship*, *9*(2/3), 99–120. https://doi.org/10.1080/19322909.2015.1076710

Gillis, R. (2017). Watch your language: word choice in library website usability. *Partnership: The Canadian Journal of Library & Information Practice & Research*, *12*(1), 1–27.

Laster, S., Stitz, T., Bove, F., & Wise, C. (2011). Transitioning from marketing-oriented design to user-oriented design: A case study. *Journal of Web Librarianship*, *5*(4), 299–321. https://doi.org/10.1080/19322909.2011.623517

Resau, K. (2021). Using Zoom for remote usability testing. *Computers in Libraries*, *41*(1), 22–26.

Shea-Tinn Yeh, & Brown, C. C. (2014). From an autonomous to a collaborative website redesign process: The University of Denver Libraries experience. *Collaborative Librarianship*, *6*(4), 135.

Solomon, Laura. Overcoming preconceptions of the perfect library website: Anecdotes versus research. (2022). *Library Technology Reports*, *58*(3), 5–8.

Sundt, A., & Eastman, T. (2019). Informing website navigation design with team-based card sorting. *Journal of Web Librarianship*, *13*(1), 37–60. https://doi-org.ezproxy.loyno.edu/10.1080/19322909.2018.1544873

Tomeo, M. (2012). Adding users to the website design process. *Public Services Quarterly*, *8*(4), 350–358. https://doi.org/10.1080/15228959.2012.730414

Vargas Ochoa, I. (2020). Navigation design and library terminology: Findings from a user-centered usability study on a library website. *Information Technology & Libraries*, *39*(4), 1–15. https://doi.org/10.6017/ital.v39i4.12123

Vecchione, A., Brown, D., Allen, E., & Baschnagel, A. (2016). Tracking user behavior with Google Analytics Events on an academic library web site. *Journal of Web Librarianship*, *10*(3), 161–175. https://doi.org/10.1080/19322909.2016.1175330

Williamson, Wikle, O. M., Becker, D., Seiferle-Valencia, M., Doney, J., & Martinez, J. (2022). Using static web technologies and Git-based workflows to re-design and maintain a library website (quickly) with non-technical staff. *College & Undergraduate Libraries, 28*(2), 129–147. https://doi.org/10.1080/10691316.2021.1887036