Designing and Building a New Website for a Public Library

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A Capstone Presented to the Information Technology College Faculty
of Western Governors University
in Partial Fulfillment of the Requirements for the Degree
Master of Science in Information Technology Management

February 20, 2015

Abstract

The purpose of this capstone project is to design and build a new website for a Public Library. The existing website is more than five years old, using older Web 1.0 concepts, where users can receive information without being given the opportunity to post reviews, comments, and give feedback. As a "one-way" website, the Library is unable to provide a rich experience to its users, and does not take advantage of the advances made in technology made since its inception.

The proposed site will become a "third space" electronic branch, offering most services that are provided in the branches. Taxpayers in the Library's service area will be better served by this site, allowing them to access virtual materials and library services without having to visit a physical branch. Library staff will have another tool to expand the number and quality of services that they offer. Visitors and viewers from other regions can use the site to get an unfiltered view of the area's characteristics, commerce, and resources. Patrons, staff, and local officials will be given an opportunity to express their opinions and ask questions to determine the type of content and services they would like to see on the new site.

The new website will be based upon Web 2.0 design and principles. It will give patrons an opportunity to comment on services and review materials, and will help Library staff to focus their resources on those services that are most wanted and needed. It will also provide a rich mobile application, allowing patrons to access web services from smartphones, tablets, and other remote access devices. The site will be built from the ground up, and not be an update of the current site. It will integrate existing web technology, and provide a platform for future web improvements.

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Introduction

[redacted] City-County Library District (the District) is a Public Library system in [redacted] County, MO, with a website at [redacted] In 2010, the website was redesigned from HTML coding to a CMS controlled site, using an open-source application named Drupal. In 2014, the District Management team agreed that the 2010 update was becoming obsolete, and a site refresh was necessary.

After the update project ended in 2010, the District was unable to fund a dedicated Web Developer or Webmaster position. It relied on a small consulting budget to keep the site running and to add minimal changes and additions as necessary. In-house IT staff gradually took over from the consultants, but was not qualified to modify customized code or to add additional functionality to the site. Other than content, there were no major changes since the end of the update project.

Since the site is a tax funded service, several restrictions and requirements exist for taxpayer use that do not exist for privately and publicly owned organizations and businesses. Because of changes in technology and legislation since the last update, the existing site did not conform or comply with current legal and technical standards. Compared with peer sites, the District site was not providing equivalent services. Based upon advances in Internet technology and interactive products found on other sites, patrons expected more and better services on a Public Library website. The site became more difficult to navigate and less user friendly. The District merely maintained the site rather than keep up with advances in technology and site design. As a result, a much larger project was needed to bring the site up to standards and to meet patrons' expectations.

Project scope

The process for developing a Public Library website varies depending upon the size of the Library, the available budget, the staff skills available, and the condition of the existing site. This project looks at the process of redesigning an existing 500-page website, and rebuilding it from the ground up. The project follows the flow of the project, starting with the initial decision of whether a redesign is necessary or imperative, and culminating with a post-implementation review and evaluation of both the site and the process.

The project covers the technical and structural aspects of the website, including the choice of underlying content management system, site coding, and recommended site features. It covers the hosting server: its location, software and hardware. It also covers related areas, such as security, bandwidth, legal and accessibility requirements, mobile considerations, and maintenance and upgrade plans. Finally, the project explores the decision process in making these determinations from available alternatives.

The project does not cover content or features specific to the District. Internal and external comments and surveys, staff input, and an examination of the existing site will drive content discussion and selection. Since these decisions are not technical, they are not included in this project.

Defense of the Solution

Refreshing or remaking a website is a subjective decision, with no standardized answer. According to Ian Mills, Co-Founder and CEO of web design firm Magicdust, some factors to consider are:

- Your site does not integrate social media. Including links to your social network profiles is the bare minimum you should include – even better is adding social sharing tools that

make it easy for users to share, tweet, or pin your content.

- The website design looks old and outdated. If the aesthetics of the website design is old the chances are that the user experience is also going to be lacking.
- The website is not mobile-friendly. Mobile users expect to get what they want very quickly and easily, and want to have "mobile intelligent" features, like one click dialing for example. So it is important that the website is optimized for mobile devices to ensure the best user experience (Mills, 2014).

The existing website was lacking in all of these aspects, and more. In order to address these deficiencies, and add additional features and functions, the District needed to evaluate the current site. A comprehensive and objective plan needed to determine the extent of the changes and alternatives available to the District.

The only justifiable solution was to remake the website from the ground up. The number of technological and design changes made it impractical to update the site in place. The only aspect of the site worth porting to a new site was the content. In order to clean up the site, and ensure that there are no dead pages or links, the new site must migrate only selected content. Since this also was a major version upgrade, installing a fresh version on a new server avoided security and feature incompatibility.

Methodology Justification

The library district had to update the website in order to provide the online experience that patrons expect. This means that District management had to decide the correct path to providing a user-friendly, informational, interactive website, that takes advantage of the latest technology and is easy to use. Opinions differ on an “expiration date” for a website, but

according to web designer Amber Leigh Turner, "(The) general rule of thumb is you should completely revamp at least the look of your site every three years, and possibly the functionality every five years" (Turner, 2012). Since the site was last redone in 2010, management made the decision to do a major upgrade of the site. This project addresses the problem many tax funded, local government agencies face. Many agencies are not large enough or have an adequate budget to hire a web specialist to maintain or overhaul their public website. In addition, there were many choices and numerous decisions to make during the project.

Many customers and staff expressed a need for a more responsive and user friendly website. Over the last few years, IT staff has maintained, but not advanced the technology used when the site was last overhauled five years ago. Management staff assumed that the budget would allow the addition of a person dedicated to web design and maintenance, but because of unplanned financial issues, the position was put on hold. Existing staff attended training classes and were able to perform routine maintenance, but they do not have the time or expertise to perform major upgrades or install new technology like developing a responsive mobile site. The existing site functions well, with minimal downtime and quick response. The site's main function, as an information repository and portal, still fulfilled the needs of the staff and patrons. However, as other libraries improve and upgrade their sites, they set a higher bar for all their peers, and raised the expectations of those using the District's website.

According to Ian Mills:

It has been said that one human year equals at least four Internet years. That's how fast technology is progressing, however some website platforms and content management systems haven't kept up. They may have been great a few years ago, but if your website has been built on older technology you may find your editing choices will become limited

as new features become desirable, and you may also be more vulnerable to security breaches and unwanted hacks(Mills, 2014).

Public libraries are in the midst of a major transformation. They are moving away from lending books and other materials and into electronic resources, public access to technology, and e-books. Like so many other time-honored institutions of intellectual and cultural life—publishing, journalism, and the university, to name a few—the library finds itself on a precipice at the dawn of a digital era. What are libraries for, if not storing and circulating books? With their hearts cut out, how can they survive? (Agresta, 2014) One part of this evolution is the advance of the library website, becoming more than just a portal to information. It should come as no surprise that 50% of millennials confirm having used a public library in the last year, a slightly higher total than the 47% of those over 30. As a group, Millennials are as likely as older adults to have used a library in the past 12 months, and more likely to have used a library website. Some 36% of younger Americans used a library website in that time frame, compared with 28% of those 30 and older. Overall, the percentage of all Americans who visited a library in person in the previous year fell from our 2012 to 2013 surveys, but the percentage who used a library website increased (Zickuhr & Rainie, 2014).

This shift emphasizes the need to offer a library website that not only offers a traditional portal, but also one that will serve the expectations of a public that is moving away from brick and mortar to virtual libraries. Unless the District updated the site, it would not perform that function.

All the users of the site requested changes and updates. Both patrons and staff pointed out obvious differences between the District's site and those of other libraries. Since the last refresh in 2010, standards and expectations changed so drastically, that doing nothing was not an

option. The recommended approach of a complete redo of the site made both financial and logistical sense. Minor changes and updates would require more extensive research and testing than building a new site from the ground up. Also, major advances in web development since 2010 made upgrading the system more difficult and prone to error than trying to reconstruct the site from the beginning.

Analysis of the Problem

The management and stakeholders developed and prioritized a list of features and functions that were necessary to provide a user friendly, fully functional website that would support library patrons and staff. The District surveyed customers and users of the site to determine their needs and wants, and used their input to further refine the requirements for the new site.

Problem Statement

As mentioned, the existing website was inadequate and outdated in several areas. Since the last major redo in 2010, the site was not updated to include or take advantage of the new technology and design standards developed during this time. As a result, many features and services provided by other libraries did not exist on the site, and the site's layout was outdated and disorganized.

The District's management decided to update the site, but it was determined that a simple update would not be adequate. The site's existing CMS was two versions out of date, there were many dead links and pages, and current design standards were vastly different than the ones used in 2010. It made more financial and logistical sense to completely redo the site, migrating valid content and installing, not upgrading, the content management system.

The major reason the site was so outdated was that the District did not prioritize its maintenance and support. It was not given a proper budget, and other projects were given a higher priority. Unfortunately, this lack of importance resulted in an increasing number of deficiencies and caused the site to continually fall behind existing standards.

Problem Causes

There were several causes for the problem. First, technology is progressing at such a rapid pace that unless you maintain and upgrade websites on a regular basis, it becomes more difficult to complete the cumulative changes that have accrued. Due to a lack of expertise by District staff and yearly budget issues, the organization was unable to make these changes and upgrades on a timely basis. No one person was responsible for the site, and the assigned staff was only able to make the most essential security and system updates. They were also not qualified to add new technology as it became available. The site become more difficult to maintain, and some underlying software reached end of life and was no longer supported.

Second, there was no oversight, and areas of the site became orphaned and contained outdated or incorrect data. The lack of documentation caused some information to be duplicated or missed as various staff members entered web pages without coordinating with other staff.

Third, not only did technology change, but industry standards of usability and visibility, graphics usage, and page layout also changed. While the site was written using CSS for formatting, the underlying code and style selection became outdated, and the look and function of the site differed from the sites using new web technology and design.

As social media became more prevalent, and mobile websites began to draw users, the District did not fully follow the need to serve these patrons. The existing site made minimal use of social media, and the mobile site only performed basic site functions.

Finally, management did not put a high priority on the maintenance and development of the site until recently. As circulation and gate counts dropped, site visits and online services began to rise. The site did not have search engine optimization or analytic software installed that could have enabled trend analysis and gather visitor statistics.

Stakeholder Impacts

The problem impacted many stakeholders in the District's service area. Taxpayers were not getting the best service for their tax dollars. The current site was more likely to be vulnerable to attack, slow, have a dated look, and difficult to navigate and find information. In addition, patrons in other library service areas where the library website has been upgraded and properly maintained were benefitting from newer technology, modern design, and easier searching and indexing.

Newer technology impacts:

- Security - it may be possible a hacker could gain entry to a site and access sensitive data, deface the website or use the server to attack other websites and computers around the world.
- Browser Compatibility - when new versions of a browser is released it is quite possible that it will interpret the website differently to the older browser.
- Improved Speed - With new technologies and methods to speed up websites it's likely older websites could do with a speed boost.
- Social Networking and Marketing - More and more people are online and the internet their primary source of information and reference. A website needs to get on the bandwagon or be left behind.

Modern design benefits - The most visual aspect of a website will sadly look dated over time. You know that 70′s block of flats down the road that's a bit of an eye sore? A website may be the online equivalent, putting people off using services or buying products. ("Benefits of Updating/Upgrading a Website")

Easier Searching and Indexing -

- Search engines are constantly looking for content that appears to be relevant to the search terms used. The more recent the content and the relevance to the search terms, the more likely it is that a business move up in the ranking.
- Depending on the terms or phrase used in a search, local businesses will frequently show up higher in the search results. It's important for the search engines to know where you are located.

Adding relevant content will have a big impact on how visitors perceive your company. (Ayers, 2012)

Problem Analysis

Cost Analysis

As a rule, public libraries are funded by taxes. Some libraries are part of a larger governmental organization, and as such, are part of the organizations total budget. Others may derive most of their income from sales or property taxes. Even though public libraries are funded by some combination of local, state and federal dollars, the mix is unique. ("Debunk The Myths")

Estimating the costs associated can be difficult. However, since many public libraries, including the District in this project, are required by law to post a bid notice, the final costs of the project were not be known until all the bids were received. In addition, federal and state grants

offset most of the costs.

Using the website www.designquote.net, an estimate for a complete redo of the existing 500 page site is:

ESTIMATE: $59,620*

*Average Estimated Price. If you hire a student you may pay as little as $23,035. Or if you use a professional company you could pay as much as $112,194. ("Web Design Pricing Calculator")

Using the winning bid price of $59,620 and a standard 75% federal library technology grant amount, the approximate cost to the District to completely redo the site would be $14,905. Using the website quote range, the true cost could be between $5,759 to $28,049. This does not include the cost of generating a new mobile site. However it does include the cost of programming, content entry, and training. The cost of creating a new mobile site in addition to the main site by using an online generator is minimal, and customization could be handled by existing staff.

Risk Analysis

The alienation of existing site users poses the greatest risk to completely redoing the site. It is human nature to react negatively when something we've become so comfortable with changes without warning. So when your new brand is launched on the unsuspecting public, you're bound to have a little backlash—or in some cases, a lot of backlash. (Wickwire, 2014)

One of the most prevalent risks in website design is mission or scope creep. As the project progresses, staff will have a tendency to want to add or change content and/or features. Some of the common forms of scope creep include:

- Fresh images on each site visit
- Unlimited image slideshows

- Page counters
- Web copy and content
- Additional pages
- Blogging services
- Social media account set up and management
- Periodic updates
- SEO services

There is also the risk of losing existing Search Engine Optimization. There could possibly be a massive impact on search engine rankings and subsequent traffic due to a redesign migration. Existing links from other websites may point to specific web pages that may not exist after a redesign, and search engines will take a while to crawl and update the newly redesigned site.

The existing website was a victim of extensive modification of code, CSS customization, and revision of third party modules. As a result, traditional training in website update did not equip staff to properly maintain the site. Necessary changes required a trained web development expert to make sure that modifications did not cause a domino effect and disable or affect other areas on the site.

Solution

As noted, the existing website was in urgent need of a complete redo. Because the District was unable to hire a web development specialist, and website maintenance was handed over to untrained in-house staff, an upgrade or a series of incremental changes was not feasible. While the in-house staff kept the site running, they were unable to keep up with changes in technology and site design since the site was last redone in 2010.

A web committee was formed from District staff and stakeholders. The committee gathered input from staff and customer stakeholders. This input critiqued the existing site and noted the perceived strengths and weaknesses. The web committee looked for patterns that formed the basis of the redo, keeping features that were deemed favorable, and looked for alternative ways to address deficiencies listed by the stakeholders.

The team developed specifications and requirements that were the basis of a bid proposal that was posted in multiple media outlets. The proposal listed priority features and other specifications that must be integrated into the site. The proposal stated the evaluation criteria in determining the winning bid, any legal requirements, deadlines, penalties, and project specific requirements. The bid was posted for the length of time required by policy and law.

The staff evaluated the bids, and a winning vendor selected. Management met with the vendor to coordinate and plan the project. Bid specifications were reviewed and any discrepancy between the vendor's bid and in the expectations of staff were resolved and documented.

The site build was constantly monitored and meetings between staff and the vendor were held on a regular basis. Any changes or additional work was noted on change orders, and approved by the appropriate District manager. As the site was rebuilt, parallel testing and comparison ensured that the new site retained the functions that were favored during the stakeholder input.

The site was constantly be evaluated during the process to ensure that it met the desired expectations and requirements. These included but were not limited to usability, accessibility, technological relevancy, improved navigation, enhanced visual appeal, and upgraded performance.

When both the vendor and District staff agreed that the redone site was nearing

completion, the District began promoting the coming changes, reducing the chance of surprising customers. Upon completion, a "go live" date was set, and the existing site was replaced by the redone site.

Approach Justification

This project plan undid and corrected years of neglected upgrades and improvements. Since the existing site consisted of older versions of software, the redone site took advantage of:

- Application Improvements – program patches, bugs, performance issues, and dead web pages caused the site to operate more slowly and with application glitches. A completely rebuilt site eliminated overlooked modifications, patches, and dead pages, increasing the likelihood of a well-functioning, well-tuned website.
- New Features – most improved and new features require the latest version of software in order to perform properly or to function at all. Since 2010, new features have been developed, especially those that interface with social networking and perform interactive transactions.
- Improved Security – Malware and dangerous attacks against websites had multiplied since the last redo of the site. In order to protect the site from hacking and other malicious actions, the site needed to be running current versions of software, some of which require new and upgraded systems.
- Cost Savings – a complete redo was less expensive than incremental upgrades in that a complete redo did not miss any necessary changes or additions to the system, and reduced the possibility of the "domino effect", where a patch or update breaks other parts of the site.

- Search Engine Optimization – Website indexing and search from external sites like Google and Bing have changed drastically in the last few years. Today Google's algorithms rely on more than 200 unique signals or "clues" that make it possible to guess what you might really be looking for. These signals include things like the terms on websites, the freshness of content, your region and PageRank. ("Algorithms – Inside Search – Google") These conditions do not apply to older websites that do not conform to modern search algorithm criteria.

Risk Assessment

There were several risks associated with this project.

- Grant funds not approved – In this case, the CFO and management would have made use of a predetermined contingency fund, that is, money earmarked from the budget to fill in the gap.
- Bid process did not produce a viable vendor solution – If none of the responding vendors submited a bid that fulfills the budgetary or design requirements, the District had two possible solutions: The first would be to submit a re-bid request to all vendors that responded, as well as advertise the bid opportunity in more venues than those in the first bid. Second, if this did not produce the desired result, the bid requirements including cost, features, and level of services provided by the vendor would be examined and adjusted. Also, in this instance, staff would take over some of the services requested, such as content entry, which did not require a high level of specialized skills.
- Vendor does not perform work according to contract – A performance bond was required to ensure that the District was protected if the vendor was unable to adhere to the timeline, if there were staff changes, or there were circumstances where the vendor could

no finish the project. In addition, penalties and incentives were built into the contract to ensure compliance. Finally, payments were spread out as milestones were reached, and appropriate staff signed off and accepted the work.

- The new site is vulnerable and is attacked - The site is very well backed up, and security measures are up to date. If the site was still attacked, a security specialist would be contracted to patch and protect the site, and it would be restored to the condition before the breach.

Project Requirements and Design

Execution Requirements

In order to fully support and execute the project, the District needed to gain the full backing of the management team and the governing board. Once the Executive Director and other senior management made this project a priority, resources needed to be allocated in order to fill the needs of the project. Money, staff time, and a commitment to creating a robust and interactive website provided a solid base for the project.

In addition, management committed assets to maintain and upgrade the site when necessary, and to support the site with marketing and social media resources. This included surveys and aggressive solicitation of user feedback with surveys and questionnaires. This feedback helped to determine if the changes were effective, and that the site was fulfilling the needs of the community.

Existing Gaps

The project filled the educational and informational gaps that had formed due to the lack of maintenance and support for the site. One of the missions of the library is to provide taxpayers with physical and virtual places to store and disseminate information, and to provide

them with the latest technology available to utilize nearly infinite electronic services now available.

The project also closed a gap in the support of social media. The previous version of the site did not recognize Facebook, Twitter, Instagram, and other social media. The new site provided links to the District's accounts on these and other sites, and provided areas where patrons could interact with staff. Ask the librarian, user comments, and staff blogs are just several examples of new features that are available on the new site.

Finally, the new site is scalable, and provides support for mobile devices. The previous site did not scale well on phones and other small screens, and relied on desktop browser specifications and features to present information.

Project Development and Implementation

Project Plan

Scope.

The project covered the technical and structural aspects of the website, including the choice of underlying content management system, site coding, and recommended site features. The project included the details of the RFP bid process, and the timelines and milestones used to plan and guide the project. It covered the hosting server: its location, and requirements. It also covered related areas, such as security, bandwidth, legal and accessibility requirements, mobile considerations, and maintenance and upgrade plans. Finally, the project explored the decision process in making these determinations from available alternatives.

The project did not cover content or features specific to the District. Internal and external comments and surveys, staff input, and an examination of the existing site steered content discussion and selection. Since these decisions were not technical, they were not included in this project.

The project also did not cover specifics as to the marketing and promotion of the site redo. Again, since these are not technical, they were excluded.

Assumptions.

The main assumption was that the existing website would be the basis for the redesign. Current content that was still relevant was migrated to the redesigned site, and existing features were maintained, either in their present or upgraded form (if offered). We assumed that 25% matching funds will be available from the District budget, and that the District would qualify and receive the requested grant funds. While the bid might not go to the low bidder, we were assuming that the winning vendor will bid close to the estimated median bid.

We also assumed that the District would ultimately decide to keep Drupal, the present content management system, but upgrade to the latest version, and the redo would be done by contracted developers, not in-house staff. Also, the developers and staff would conduct extensive parallel testing to ensure that popular features continued to function, even if the method or look of the feature was upgraded.

Finally, we assumed that the IT Director would act as the project manager on the upgrade.

Project phases.

- Research and planning (2 to 10 weeks) Areas covered at this stage included research; stakeholder input, formation of a web committee, existing website evaluation, requirements and definitions document; site architecture plan; wireframes and sitemap creation.
- Bid process (2-4 weeks) Requirements prioritized and used to create bid specifications. Request for proposal posted and bids received and evaluated. (See Appendix C for

sample RFP). Winning vendor selected.

- Design (2 to 4 weeks) Server acquired, CMS software installed, backend software configured and technical details settled. Additional services such as database, caching software and security software acquired and configured. Homepage and site CSS and templates created. Subpages designed and drafted. Menus and terminology settled. Marketing Department will create new graphics and other visual features.
- Development, content rewrite, and programming (10-20 weeks) Establishing key messages and interactivity, porting over content from existing sites, writing new text, editing text, creating headlines, page titles, captions and SEO optimized text, headlines, descriptions and tags. Includes technology and non-design aspects of building web sites: customizing the content management system, writing markup and coding.
- Beta testing and review (4 to 8 weeks) Necessary stakeholders given opportunity for review and feedback in a password-protected location. Testing is also conducted to ensure the site is optimized across multiple browsers, screens and mobile devices and ensure the site is performing as it should prior to launch.
- Site launch – go live (1 day to 1 week) DNS changed to point to updated site instead of old site. Existing site held in reserve in case of major complications and rollback is needed.
- Maintenance and enhancements (continuing) New site will need to be monitored and updated in order to keep the site current and secure. Once a site has gone live, there is always room for ongoing improvements and updates

Timelines.

Timelines (See Appendix A for projected timeline chart.)
(See Appendix B for actual timeline.)

1. Project manager to research and develop presentation justifying website redesign.
2. Buy-in and consent by major stakeholders to proceed with the project. The project manager will make a presentation to management and other staff most affected by the project. The presentation will include the need for the redesign, the goals of the project, and the alternatives and preferred solution.
3. Meeting(s) with stakeholders to outline the project and create a project team. Decisions will be made on project objectives and goals, projected timeline, team members, resources needed, projected budget, possible risks and rewards.
4. Benchmark and evaluate the existing website. This includes site analytics, staff and customer surveys, comparison of existing site with other library sites to set benchmarks and goals, and research on site compliance with ADA and other legal requirements.
5. Develop and prioritize requirements for new site. Set the proposed budget, determine the essential features and upgrades, develop a matrix for bid evaluation, and list necessary technology requirements using survey results, site comparisons, and research results. Use these requirements and priorities to develop bid specifications.
6. Post and evaluate bids. Select the vendor that provides the best value. While value can be subjective, contributing factors can include price, previous experience with similar sites or project portfolio, proven ability and resources to perform job on time and within budget, proposed maintenance and support services.
7. Meet with winning vendor to coordinate and develop specific attributes of site. Include design and technical requirements and prioritize the development of new features. List existing pages and features that will remain on the new site.
8. Vendor begins work on site.

9. Vendor provides interim reports according to timeline.
10. Vendor and project team agree that site is 80 percent completed. Marketing staff begins promoting new website coming soon.
11. Vendor completes final quality control and testing checklist. Project team signs off on performance and design of site.
12. New site goes live.
13. Project team signs off on live site.
14. Evaluation and feedback from staff and patrons documented and examined.
15. Follow-up and lessons-learned meeting.

Dependencies.

Looking at the actual timeline, you can discern the project steps that were dependent on other steps being completed. These included:

- Research and Develop Justification before Presentation to Management
- Outline Project and Create Team and Benchmark Existing Website before Develop and Prioritize Requirements for New Site
- Develop and Prioritize Requirements for New Site before Develop and Post Bid
- Develop and Post Bid before Evaluate Bids and Name Vendor
- Technical Design of Site before Development and Programming
- Beta Testing and Review and Marketing Staff Promotes New Site before site goes live
- Site goes live before Follow-up and Lessons Learned

Resource Requirements.

The following internal personnel were involved in the project:

- Stakeholders –Primarily involved in the research, design, and review phases.
- Project Manager/Technical Advisor – Involved in all phases of the project, from initial research through the lessons learned meeting after site launch. Responsible for technical considerations and evaluation of proposed site capabilities.
- Web Team – Representatives of stakeholders, made up of staff from various departments
- CFO – Involved in the planning and bid phases - set and monitored the overall budget for the project, and when necessary if a change order or modification was needed.
- CEO – Involved in the planning process to provide an ultimate decision on whether to proceed with the project, and as an advocate during the entire process to promote buy-in by others in the organization.
- IT Staff – Worked with the Project Manager and web development vendor during the design and development phases to configure, and monitor the server and act as a liaison between the web development vendor and the server host vendor. Maintain the upgraded site features and content after launch. Temporary data entry staff migrated content from existing to new site during development phase.
- Marketing Staff – Provided promotional documentation and multimedia support, and influenced the design of the site. Also provided the graphics, multimedia content, and verbiage on the new site during the design phase.
- Various District Staff – Performed beta testing and determined if upgraded site met requirements during the review phase.

Since the project utilized third party resources for a majority of the tasks, the only resources required by the District are monetary, in the form of a budget for services, and personnel, as listed above. There was an additional need for security software, graphics software

for the marketing department, and software to support new features. Staff needed subscriptions to some online support sites in order to maintain the site after launch.

The server is hosted on the cloud by a third party vendor, meaning that there are no hardware requirements specifically for the project. In addition to a server to host the site, the host vendor supplies:

- Server security and maintenance
- Backup and disaster recovery services
- Guaranteed uptime dependent upon the SLA
- CMS system and Internet server software

The web development vendor provides the following tools in building the site:

- CSS, JavaScript, and Web 2.0 tools and features including AJAX, social networking, folksonomies, lightweight collaboration, social bookmarking, and media sharing.
- CMS module downloads and customization
- Third party software integration and social networking incorporation.

As mentioned previously, up to seventy-five percent of the project costs were provided by federal or state grants. However, if for some reason the requests were not granted, the District would commit the full amount of funds necessary to complete the project. An itemized list of costs includes:

- Cost of web development vendor to perform the design, coding, and implementation of the updated site. This cost will was not known until all of the bids were returned and evaluated. A primary consideration is the amount of funds available for the project. Bids could be on a “time and materials” basis, where the bid is given in a per hour basis. Or, it

could be on a project basis, where the details of the project are very specific and the project is bid as a whole. According to Bernard Kohan, a web application development and technology analyst expert, proposals can range from $5000 to $300,000, from several web development companies. There are different types of development companies with different business models, which creates different cost structures. Some examples are:

- "Extravagant Class" Custom Web Development Companies - Their average web application development cost is around $500K and their staff or contractors' salary is in the six figure plus range. Their development rate ranges from $400 - $800 per hour.
- "Moderate Class" Custom Development Companies - These types of companies tend to have a moderate and reasonable spending and operation. Their average number of employees are in the 10-20 range. Their proposals are usually based on the estimated hours at the development rate ranging from $100 - $200 per hour.
- "Small Class" Development Companies - These types of businesses run their operation on a very low budget and usually has only 2-3 workers including the business owners / partners in the company. Their proposals are usually based on estimated hours at the development rate ranging from $75 - $180 per hour.
- Independent Contractor Developers - Independent contractors have their own different class of financial expectations, and their rate is based on their knowledge and experience and / or other factors such as cost of living, financial needs and spending habits. Their rate can range anywhere from $50 - $250 per hour.

- Low Cost, Mass Producing Template Level Off-shore Development Companies - These types of development companies concentrate on mass producing template type web sites. Their rate can range anywhere from $35 - $90 per hour. (Kohan, "Web Development Cost / Rate Comparison - Different Types of Custom Web Application Companies")

Since the District had a detailed plan, and based upon an existing site and a well-defined set of specifications, a project based bid system was appropriate. Evaluating the type of developer that would fit that requirement, it was assumed that most and least expensive vendors would be eliminated, and the winning bid would come from independent, moderate, or small class vendors.

- Cost of website hosting – even after selecting a vendor, choosing the level and types of service was necessary. By benchmarking and using analytics to evaluate the existing site, the level of service including memory, system speed, storage, and CPU power can be better determined. As to server support, most cloud providers include backup and security, as well as operating system patching and maintenance. Again, the level of service, and associated costs, will vary. Generally, hosting is charged monthly, and a basic subscription on a shared server with godaddy.com can be as low as $4 per month. However, in order to support a site with a robust CMS, adequate speed and bandwidth, and the ability to handle thousands of requests per day, a dedicated or virtual server is required. Monthly recurring costs for these on godaddy.com are in the $60-130 per month range.

Risk Factors.

Most of the risks associated with the project are external to the organization. The first is

the risk of a financial shortfall. Funding for the project is split between the District budget and Federal Government Grant funds. Loss of either would be a severe setback to the project, but not a complete roadblock. The loss of grant funds may require the District to replace those funds from reserves, or scale down the objectives of the project. Probability – low, impact – moderate.

There is also a risk that the web development vendor may not be able to perform according to contract. A secondary vendor may be necessary to complete the project. Probability – low, impact – moderate.

After implementation, the site may be hacked, or infected by malware. In this situation, a specialty contractor may need to be hired to remedy the problem and prevent further damage. Probability – medium, impact – high.

Important Milestones.

The following milestones mark significant stages in the project:

- The project is given the go-ahead to proceed. At this point, senior management has given the project sufficient priority and is willing to commit resources to complete it.
- Requirements for the site have been determined and prioritized. The existing site has been evaluated and benchmarked, and the necessary improvements are detailed and ranked according to importance. Features and changes are categorized into either essential or desired.
- Bids have been requested, received and evaluated, and a vendor is selected. After presentations and interviews, a vendor is chosen based upon qualifications and ability to fulfill requirements. Development and design can begin.

- Site technology, navigation, layout, and appearance have been designed by the vendor and approved by web committee. At this time, the vendor has proposed several alternatives for the "look and feel" and technical operations of the site, and the committee instructs the vendor to begin coding.
- Vendor informs the project manager that initial coding and development is complete, and, based upon continued dialog with the web committee, is ready for parallel testing and review. The site pretty much looks like the final product, and staff is enlisted to perform testing. They are instructed to use all parts of the site and attempt to perform any likely transactions or activities. Staff feedback provides vendor with a list of errors found and adjustments that need to be made.
- Web committee signs off and site is launched. Staff has been trained, marketing and promotions for the new site are active. The redone site replaces the existing site.
- Web committee is satisfied that the new site functions well, and vendor is given final payment. At this point, the active project is complete. In a few months, there will be a follow-up meeting to determine the effectiveness of the project and to provide final documentation for archive.

Deliverables.

All of the deliverables will be electronic or saved in an electronic format:

- The final website – with all upgrades and new features and their documents and instructions.
- Project documentation – this includes the meeting minutes, bid and vendor information, wireframes and site navigation notes, e-mail and other electronic

communications, vendor and staff notes, survey and feedback information.

- Technical documentation – instructions, coding notes, training documents, application documentation
- Examples of marketing and promotional materials

Project Development

Implementation Plan

Strategy for the implementation.

The staff and customers of the District's convinced senior management and the governing board to allocate time and resources to upgrade the District website to current standards and expectations. Customers convinced them that they were not getting the full benefit of their tax dollars, and had developed several criteria necessary to bring the site to the level of the library's peers. The IT Manager was tasked to quantify and provide hard data to justify the expense.

After several weeks of research, a set of technical and practical deficiencies was presented to the managers and other stakeholders, who added their thoughts and input. From this, a plan developed to upgrade the site. Since the site needed so many upgrades, and was so far behind current software and applications, it was decided to create a completely new site, migrating content that was still current and relevant.

A committee of District staff and stakeholders was formed to guide the process, and the IT Manager was chosen to manage the project. Preparations were made for funding, designing, developing, testing, and launching of the site, with long range plans for maintaining and updating the site and its content.

Phases of the rollout.

The major phases are:

1. Research, project justification presentation, acceptance and approval by management. During this phase, initial research looked at the existing site and began the process of developing justification for the project. An initial presentation before senior management, the governing board, and other stakeholders outlines the justification and goals of the project. After approval of senior management, the governing board, and other stakeholders, the project moves on to the next phase.
2. Creation of web committee, input by stakeholders, construction of Project Plan, development of necessary and essential requirements, and creation of Request for Bid.
3. Bid process – posting, evaluation, award, and contract. This phase covers all aspects of selecting and setting up initial meetings with web development vendor. After approval web committee, the project moves on to the next phase.
4. Technical and visual design, development, and programming of the new site. During this phase, there are regular meetings between the developing vendor and the web committee. Documentation is created that compares the contractual requirements versus actual work and timeline and budget are adjusted accordingly. During this time, there may be additional features requested, or minor changes required correct unforeseen problems. Project management controls are used prevent or mitigate additional costs and time. Both the web committee and vendor must agree that the project should move on to the next phase.

5. Migration of data, beta testing and review. Both the vendor and District staff migrate relevant content from the old to the new site. Test data is input to interactive areas to evaluate code and data flow, and relevant changes are made to the site. At the same time, the marketing department begins to promote the new site, and staff is trained to assist customers and how to use the site themselves. The web committee must be satisfied that the testing is through and that the site is ready for launch.

Details of the project launch.

The new site replaces the existing site and both staff and the development vendor monitor usage for problems or unexpected results. Staff interacts with customers in person and online to assist them in finding features and content that they were familiar with on the old site, and assists them with all aspects of the transition. Those customers that are resistant to, or are unhappy with change, are given special attention when they give negative feedback to staff. The site will not be considered to be fully launched until the number of changes and requests for help reach a level acceptable to management and staff. Some specific metrics include a decreasing number of minor changes that only affect individual users, and no major glitches with the system. Also, maintenance and updates on the site are done on a regular schedule, and not in a reactive mode. This may be a number of weeks or months, depending upon customer satisfaction. In this project, the launch was considered complete after six weeks.

Dependencies.

Looking at the actual timeline, you can discern the project steps that were dependent on other steps being completed. These included:

- Research and Develop Justification before Presentation to Management

- Outline Project and Create Team and Benchmark Existing Website before Develop and Prioritize Requirements for New Site
- Develop and Prioritize Requirements for New Site before Develop and Post Bid
- Develop and Post Bid before Evaluate Bids and Name Vendor
- Technical Design of Site before Development and Programming
- Beta Testing and Review and Marketing Staff Promotes New Site before site goes live
- Site goes live before Follow-up and Lessons Learned

Deliverables.

All of the deliverables will be electronic or saved in an electronic format:

- The final website – with all upgrades and new features and their documents and instructions.
- Project documentation – this includes the meeting minutes, bid and vendor information, wireframes and site navigation notes, e-mail and other electronic communications, vendor and staff notes, survey and feedback information.
- Technical documentation – instructions, coding notes, training documents, application documentation
- Examples of marketing and promotional materials

Training plan for users.

There were two types of training: one for staff and one for customers. Staff training was formal, with online and instructor lead classes, as well as webinars and printed materials. The staff started with a "tour" of the new site, highlighting the new features, and pointing out new locations for popular content that has moved. They had an opportunity to test the site as a user,

experimenting with data flow and searching the site for content and features. A forum allowed the staff to ask questions and receive answers in an online environment where the information was shared with the entire staff. They were also given access to an online repository of videos, documentation, and other multimedia that related to the use of the site. An entire section was devoted to customer service and support.

Customer training was more informal. The customer service and support module presented to staff included talking points and answers to frequently answered questions that may come from customers. Customers were directed to a site map that is a visual representation of features and content. There is also a set of help and contact pages that are available to assist users with finding information and using the site features.

Quality Assurance

Quality Assurance Approach

The primary approach to quality assurance was to allow staff to act as regular customers, visiting pages and using features to determine if there were any unexpected results or program crashes.

Solution Testing

As regular customers, staff were instructed to try and "break the system" and go beyond traditional site use. Entering invalid field information, attempting to visit pages beyond following links, and using different browsers were some ways of testing the site for usability and error control.

They were told to try and find specific information. They were to document the method they used and the effectiveness of that method. Statements like "How many pages did you need to click on in order to find the information" and "Was the information easy to find using the

search feature" were among the specific questions used to determine the effectiveness of navigation and search tools, including links and menus. SEO tests conducted after launch determined the effectiveness of the search optimization tools used in developing the site.

Testers were told to use multiple browsers: Apple Safari, Microsoft Internet Explorer, Google Chrome and Firefox were all listed, as they were instructed to view the same pages on all browsers and note any issues with both the images and functions of the pages. In addition to PC browsers, testers were given tablets and mobile devices and instructed to repeat their tests.

Behind the scenes, both the web developers and IT staff performed stress tests, simulating heavy use on individual pages and on the site itself. Bandwidth requirements, memory usage, caching and response time was benchmarked, and site settings were adjusted. Backup and restore procedures were also tested before launch to ensure that the files and databases that are used by the site are readily available and restoration procedures ensure a complete rebuild of the site.

Interfaces with third party software and Social Media were also tested to ensure that there was no data corruption or loss, and that the transition between sites was as invisible as possible.

Finally, the site was tested for security and protection against malware and hacking. Both the site programs and files and hosting hardware and software were tested using industry recognized security methods and controls.

Revisions

As part of the contract, the vendor was available after launch to address any bugs, unexpected results, security issues, site slowdowns, and other technical issues. The District's web support staff modified content and navigation based upon survey feedback. Any changes or fixes were documented and included in the project documentation.

Web support staff will continue to monitor comparable library websites and other web sources for changes in design and technology standards. Upgrades and updates will be performed after testing, to keep the site current.

Summative Evaluation Plan

Approximately six weeks after launch, the web team and other stakeholders met to discuss the results of the project. Topics of this discussion included what went right and what went wrong, lessons learned, and lists of modifications, features and upgrades that still needed to be added. Results from the surveys were evaluated to determine the overall satisfaction with the changes, and site analytics were compared to pre-update benchmarks to assess the effectiveness of the upgrade. Page visits, bounce rate, site visits and other metrics are part of the overall evaluation process. Any pages or features that appear to be underutilized or not performing according to expectations will be examined for possible improvements.

Disseminating Results

Since this is an internal project with limited distribution, there was limited dissemination of the project results. Possible requests for information may come from individual groups of stakeholders, District management, and site maintenance personnel. Documentation of the entire project was copied to online storage for easy indexing and retrieval for those requesting the information.

Post Implementation Support and Issues

Post Implementation Support

To keep from repeating the circumstances that necessitated a complete redo, the site is consistently maintained and updated. Patches and updates are applied as soon as they become available, and changes and feature requests are evaluated and added when appropriate. In

addition, a timely review process has been implemented to compare the site to its peers, and to measure it against current standards and practices. By performing regular evaluations, updates, and changes, the need for a complete redo is diminished.

The primary reason these measures were not taken in the past was a lack of prioritization by management, and a lack of experience by staff. Decisions were made in order to prevent this from recurring in the future.

1. Funds must be set aside in the yearly budget to support website maintenance, and to fund qualified support. This must be a priority in determining budget allocations if the site is to remain current and relevant.
2. Staff must continue to be trained in the latest technology and support for the website. This includes training and classes for existing staff, adding a web development consultant under contract, or hiring a qualified web developer that can proactively update and upgrade the site.
3. Elements such as site response, content maintenance, and SEO effectiveness must be kept at an acceptable level. Site analytics must be monitored, and reports generated to continuously evaluate site statistics and discover anomalies. Dead pages and links, accessibility issues, outdated content, and unused features can spoil user experiences, and reduce relevancy and satisfaction of the site. Addressing these issues can maintain the usability and popularity of the site.

Post Implementation Support Resources

- Since the budget still would not support hiring a dedicated web developer, the District chose to provide training for the existing IT staff under the supervision of a development consultant.

- Monitoring and system tuning software was purchased and installed on the cloud server in order to provide an additional layer of control past the default services provided by the cloud host.
- The existing IT staff was provided with the time and materials necessary to provide the additional support necessary to keep the site current and conforming to the latest standards.
- A discretionary budget item was included to account for unforeseen costs and emergency funding. These funds could also be used to purchase additional software, or increase the resources provided by the cloud host subscription. It can also provide technology media subscriptions and memberships, keeping the staff informed of new Internet features and upcoming changes in standards.

Maintenance Plan

A system of regular reviews and feedback was created in order to be proactive in supporting the content and technology on the site. The process itself will be reviewed for consistency and for its effectiveness at keeping the site current and updated. Also, senior staff made a priority of keeping the marketing department informed of new and updated services and content, and of providing them with the resources needed to promote the site and increase viewership.

On the technology side, built-in programs will notify IT staff of software updates and new versions of the CMS software. As the Internet moves into HTML5 and Web 3.0, the site will be monitored for changes necessary to support new technology, and to constantly look for opportunities to provide more and better services.

Finally, the site will be tested using newer versions of browsers and new mobile device systems. Necessary changes will be made in order to support these new platforms.

Conclusion, Outcomes, and Reflection

Summarize the project, deliverables, and outcomes. Outline a summary of the project, and the solution provided. Discuss the shortcomings (if any) and pitfalls with the design, development, and implementation.

Project Summary

In 2010, the [redacted] City-County Library District's website was redesigned from HTML coding to a CMS controlled site, using an open-source application named Drupal. In 2014, the District Management team agreed that the 2010 update was becoming obsolete, and a site refresh was necessary.

After the update project ended in 2010, there were no major changes. It staff merely performed necessary changes and updates, and the marketing department modified content when necessary. Because of changes in technology and legislation since the last update, the existing site did not conform or comply with current legal and technical standards.

The District's management decided to update the site, but it was determined that a simple update would not be adequate. The site's existing CMS was two versions out of date, there were many dead links and pages, and current design standards were vastly different than the ones used in 2010. It made more financial and logistical sense to completely redo the site, migrating valid content and installing, not upgrading, the content management system.

A web committee was formed from District staff and stakeholders. The committee gathered input from staff and customer stakeholders. Then, the team developed specifications and requirements that were the basis of a bid proposal that was posted in multiple media outlets. The web committee evaluated the bids, and a winning vendor was selected.

The site build was constantly monitored and meetings between staff and the vendor were held on a regular basis. As the site was rebuilt, parallel testing and comparison ensured that the new site retained the functions that were favored during the stakeholder input. At the scheduled time, staff was trained and quality assurance testing was conducted. When both the vendor and District staff agreed that the redone site was nearing completion, the District began promoting the coming changes, reducing the chance of surprising customers. Upon completion, a "go live" date was set, and the existing site was replaced by the redone site.

Approximately six weeks after launch, the web team and other stakeholders met to discuss the results of the project. A system of regular reviews and feedback was created in order to be proactive in supporting the content and technology on the site. In this process, the site will be compared to its peers, and measured against current standards and practices. By performing regular evaluations, updates, and changes, the need for a complete redo is diminished.

Deliverables

The following documentation is included with this document:

- Appendix A – Original Project Timeline
- Appendix B: Website Redesign Project Actual Timeline
- Appendix C: (separate document) Bid Posted for RFP
- Appendix D: Glossary of Common Terms
- Appendix E: Actual Bids
- Appendix F: User Location Analytics

Outcomes

The website redo was badly needed, both for the staff and patrons of the District. The updates made the site easier to navigate and use, the content was presented in a more modern

format, and the additional and upgraded features take advantage of the advances in technology and design. Perhaps the most noticeable improvement is the interactivity that is built into the site. Social media integration is driving additional projects that use the site as a tool for customer input and services, and the site also provides a platform for staff-customer interaction. It continues to be a portal to third party services, such as electronic books, databases, and web-based resources. However, the seamless path between the site and the third party resources create the appearance of one location for an information source.

The site's accessibility on mobile devices including phones and tablets has increased the number of site and page visits, as more and more customers use their cellphones, tablets and notebooks as their primary access method to the site. According to baseline statistics and post plan analytics, mobile use has surpassed workstation use, and total site use continues to rise.

The site is back to its original purpose – as a virtual branch, offering customers the same, if not more resources online than in the brick and mortar branches. Unlike the brick and mortar branches, the site's reach goes beyond the local service area. According to statistics, over 20% of site use is outside the state, and almost one percent is outside the United States.

Reflection

Beyond the success of the project, it was rewarding to see my ideas and plans benefit my organization, and to be able to see the tangible results of what I learned and experienced. As we began the project, we tried to be as open minded as possible – however, the eventual solution was the most obvious.

Perhaps the greatest reason for the success was the teamwork and compromising that took place during the process. In some ways, the success and positive collaboration on this project built alliances that were valuable on other projects. There were times where some staff

were territorial, protecting their "turf" based upon past experience. Upper management's unwavering support and allocation of resources were instrumental in smoothing out these rough spots. We constantly focused on customer service and perception, even when some people had to compromise on their "sacred cows".

By formally documenting and managing this project, we have a roadmap for other projects, including the point in the future when we will need to redo the site again. However, by instituting our site maintenance and support plan, and by documenting the project, we should not have to start at ground zero next time.

Finally, I believe that I learned more by doing – no simulation or class can substitute for actual experience, and the best teaching experiences were those that did not work as planned. The roll-out was pushed back a few times, and some stages were held up by dependent tasks, but major setbacks were largely avoided by excellent communication, cooperation and planning by all involved. No training or simulation can provide the same level of experience.

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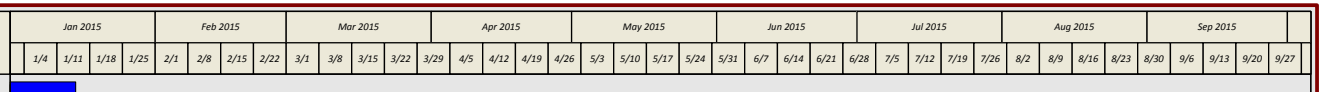
Appendix A:

Project Timeline

ID	Task Name	Start	Finish	Duration	Resource Names
1	Research and Develop Justification	1/1/2015	1/14/2015	2w	Project Manager
2	Presentation to Management	1/15/2015	1/15/2015	1d	Project Manager
3	Outline Project and Create Team	1/16/2015	1/29/2015	2w	Project Manager/ Stakeholders
4	Benchmark Existing Website	1/22/2015	2/4/2015	2w	IT Staff
5	Develop and Prioritize Requirements for New Site	2/5/2015	2/25/2015	3w	Project Manager/ Web Team
6	Develop and Post Bid	2/26/2015	2/27/2015	2d	Project Manager
7	Evaluate Bids and Name Vendor	3/2/2015	3/5/2015	4d	Project Manager/ Web Team
8	Communicate with Vendor to Develop Specifics of Site	3/9/2015	3/13/2015	1w	Project Manager/ Web Team
9	Technical Design of Site	3/16/2015	4/3/2015	3w	IT Staff/Web Designer
10	Development and Programming	3/30/2015	7/10/2015	15w	Web Designer
11	Beta Testing and Review	7/1/2015	8/11/2015	6w	Web Designer/Web Team/Stakeholders
12	Marketing Staff Promotes New Site	7/27/2015	8/14/2015	3w	Marketing Staff
13	Site Live – Tweak Minor Problems	8/17/2015	8/21/2015	1w	Web Designer/Web Team/Stakeholders
14	Follow-up and Lessons Learned	10/1/2015	10/2/2015	2d	Project Manager/ Web Team



Appendix B:

Website Redesign Project Actual Timeline

- February 9, - Request for Proposal posted on District's website. Potential vendors e-mailed with notification of bid proposal.
- March 6 – Request for Proposal closes. Each bid is scanned into .pdf file and distributed to committee members. Financial spreadsheet is created listing bids. Evaluation spreadsheet created comparing bid specs with submission results. Eighteen bids were received, and 11 are rejected for not meeting budget or specifications.
- March 12 – Website committee meets to narrow down list to determine top 4 bids. The vendors were given several weeks to prepare, and were invited to give live demonstrations on the following dates:
  - April 10
  - April 16
  - After April 16th meeting, committee ranks vendors
- April 30 – Marketing, technical, and administrative staff meet at vendor offices to discuss discovery process and explore idea for combining website design and District marketing plan and re-branding. Company references are confirmed.
- May 7 – Final details of contract are negotiated and bid awarded to vendor.
- May 28 – Discovery meeting held with District web committee and vendor staff. Web sub-committee created.
- May 29 – October - vendor staff work on site design and technical specifications based upon committee recommendations.

- June 17 –Website maintenance staff meet for orientation and to develop timeline for content input
- October 1 – January 12 - vendor works on building site and creating templates for pages on their test server.
- January 13 – vendor provides hands-on training and rolls out staff interface to site. Technical problems and staff concerns are addressed after training. More programming will be needed before staff can enter content.
- January 12 – Application for time extension and budget adjustment submitted. Approved to move project end date to April 9.
- January 26 – Staff holds separate training day to clarify issues from 1/13 training. Several issues remain, and vendor is made aware of continuing staff concerns about usability and difficulty in content entry. Staff also is concerned about slowness on vendor's server. Vendor continues to address these issues.
- February 8 – vendor needs District staff to stop work on site in order to make back-end and menu changes.
- February 15 - vendor completes menu and back-end changes. IT Department updates documentation with procedure changes. Staff is given OK to resume entering content.
- February 22 – site is moved from vendor server to Library's server in order to increase speed and provide root access to District IT Staff.
- February-April – Staff enters content to system. vendor continues to tweak system and add modules.
- April 7 – Application to extend end date. Approved to move project end date to May 31.
- April 19-27 – Site is beta tested by District staff. Staff members complete website survey.

- April 27-May 2- Website committee evaluates survey results. Gives approved changes to web maintenance staff and changes based upon survey are implemented.
- May 3 – Site goes live. Website e-mail address created for customer comments.
- May 4-17 – Web maintenance staff works on tweaking site.
- May 17 – Test/backup website created.
- June 4 – Public Survey for redesign posted – Advertisements start
- June 21 – Public Survey closed
- June 22 – Web committee meeting to discuss results of web survey and final evaluation of site makeover

Appendix D:

Glossary of Common Terms

3G

Third generation of mobile telecommunications technology

A

Ajax

Asynchronous JavaScript and XML - a technique used in web application development

C

CEO

Chief Executive Officer

CFO

Chief Financial Officer

CMS

Content Management System

CPU

Central Processing Unit

CSS

Cascading Style Sheets

D

District

Library's service area

DNS

Domain Name Service

Drupal

Specific content management system

H

HTML

Hypertext Markup Language

J

Javascript

Dynamic computer programming language

R

RFP

Request for Proposal

S

SEO

Search Engine Optimization

SLA

Service Level Agreement

W

Web2.0

Site that allows users to interact and collaborate with each other in a social media dialogue.

Appendix E: Actual Bids

Company Name	Location	Discovery, Design, Site Definition	Creation of Site	Training	Installation and setup	Testing and Deployment	Total	Per Hour Work
	[redacted] MO						$35-$45K	
	[redacted] MO	$24,357	$11,964		$17,179		$53,500	$165
	[redacted] IL						$52,560	$185
	[redacted] MO	$24,000	$12,500	$1,700	$26,000	$3,300	$51,875	$180
	[redacted] MO	$24,600	$5,625		$17,370		$47,595	$175
	[redacted] NY						$57,000	$200
Winning Bid	[redacted], MO	$18,500	$15,500	$1,500	$5,000	$5,000	$45,500	$90
	Total Design	**LSTA Funds**	**SCCCLD**					
Budgeted Amounts	$44,900.00	$33,675	$11,225					
Approved Amounts	$44,900.00	$33,675	$11,225					
Above Budget								
	[redacted] TX	$35,500	$151,925				$187,425	$175
	[redacted] WA	$18,900	$35,100	$7,800	$6,200	$13,200	$93,700	$50
	[redacted] MO	$11,555	$7,000	$1,400	$48,533	$11,000	$79,488	$130
	[redacted] NJ	$15,000	$5,000	$5,000	$30,000	$7,000	$62,000	$35
	[redacted] NY	$66,425			$3,500		$69,925	$75
	[redacted] OR	$59,500	$125/hr	$3,600			$63,100	$125
Disqualified (See Qualification Sheet)								
	[redacted] MO	$6,500					$6,500	
	[redacted] India	$3,850	$12,500	$4,500	$3,000	$4,000	$27,850	$119
	[redacted] CO	$12,600	$6,600	$600	$1,100	$1,000	$21,900	$75
	[redacted] MO	$5,000	$3,500		$3,500	$3,000	$15,000	$85
	[redacted] KS	$10,400	$75/hr					$75

Appendix F:

User Location Analytics 2/20/2015

	Country	Sessions	% Sessions
1.	United States	119,210	99.35%
2.	Canada	121	0.10%
3.	Russia	81	0.07%
4.	India	61	0.05%
5.	Germany	44	0.04%
6.	Mexico	39	0.03%
7.	United Kingdom	37	0.03%
8.	Brazil	32	0.03%
9.	Israel	30	0.03%
10.	Philippines	25	0.02%

	City	Sessions	% Sessions
1.	[redacted]	53,420	44.52%
2.	[redacted]	17,506	14.59%
3.	[redacted]	9,780	8.15%
4.	[redacted]	7,983	6.65%
5.	[redacted]	5,205	4.34%
6.	[redacted]	2,595	2.16%
7.	[redacted]	927	0.77%
8.	[redacted]	875	0.73%
9.	[redacted]	871	0.73%
10.	[redacted]	854	0.71%