

## **Coming to Content Management: Inventing Infrastructure for Organizational Knowledge Work**

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### **Biographical Sketch**

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### **Abstract**

Two project profiles depict content management as inquiry-driven practice. The first profile reflects on a project for a national professional organization that began with a deceptively simple request to improve the organization's website, but ended with recommendations that ran to the very core mission of the organization. The second profile focuses on an organization's current authoring practices and tools in order to prepare for a significant change: allowing users to develop and organize content.

## INTRODUCTION

The discussion of content management in the professional and academic discourse of technical communication has been, in large part, focused on a rather narrow range of features associated with generating multiple output formats from a single repository or “single-sourcing.” We take a different approach in this article, focusing instead on content management as “a type of conduct” (Miller, 1989, p. 23). In so doing, we align the practical work of content management (CM) with a form of reasoning, *phronesis*, that permits us to explore CM as a means to guide decision-making about the creation of knowledge, the arrangement of information, the selection of tools, and the design of work practices associated with the making of texts. Invoking *phronesis* allows us to position the focus of CM not on the making of texts, but rather on “the good of a community” for which text making is a central, sustaining activity (Miller, p. 23). This shift suggests a role for the technical communicator as advisor or consultant. Though not altogether new, this role positions the technical communicator as having authority over what are, for many organizations, the fundamentals of their mission rather than simply on matters of procedure (e.g. editorial practices, documentation strategies).

To be clear, we are not borrowing Miller’s formulation to argue for a new role for technical communicators so much as to describe how we have come to understand our own roles vis-à-vis organizations that we have consulted with in the last several years who were coming to content management. In many cases, our work began with rather simple requests to evaluate an organization’s website or to offer a workshop on a topic like “how to write for the web” – topics that we might locate in the realm of *techne*. Mindful of the richness of rhetorical *techne* (Atwill, 1998), we always expect even these types of projects to be much more than training courses or product-oriented critiques of a web presence. But the shift we want to write about here goes beyond a view of rhetoric-as-productive that concerns itself with intervention in an organization’s day-to-day work, often without explicit reference to “big ideas” such as an organization’s mission or overall effectiveness. The shift we want to write about is a moment when an organization and its members face choices in their day-to-day work that are, perhaps for the first time, unambiguously choices about the *ends* toward which they and the organization work. These organizations are coming to content management and discovering, in a discussion of the way they do their work, an explicit need to ask why they exist and what they hope to accomplish.

## WHEN ORGANIZATIONS COME TO CONTENT MANAGEMENT

In this article, we focus on organizations whose primary mission is to provide services to their customers, members, or clients. We have noticed something in common among these organizations when we have been asked to help them to improve their web sites: they are all discovering that their web site is not so much a product as it is part of their overall service mission. Increasingly, the web site is the primary way a service organization’s stakeholders expect to receive services, which may include everything from staying informed about new products or new issues to viewing customized account information to creating and storing content with the support of an existing datastore and indexing services. Organizations in this position find themselves at the doorstep of something that they may not understand well: “content management.” Just what is this? Depending on whom you ask, of course, content management can seem like a software package you buy, a set of practices you train people to use, or a new way of conducting business altogether. Consider the following list of things that are potentially involved when an organization comes to content management. This list includes possible moves in an overall shift to content management as they might be expressed in the disciplinary language of technical communication:

- Adopting new authoring practices and environments
- Coordinating software environments for editing content and metadata
- Ensuring access and continuity among datastores, markup, and metadata
- Creating publishing requirements for single-sourced output
- Designing workflows to support distributed authoring and review

- Managing genres
- Keeping track of emergent internal and external content types
- Shifting to different sub-units within a content type (e.g. topic-based organization for user assistance information)
- Adopting semantic markup schema to permit growing archives to remain usable and to systemize content reuse
- Managing delivery practices and environments
- Supporting user-customized views of information
- Adapting to content cycles influenced by time and relevance-filtered content (e.g. blogs, search results)
- Adjusting to rolling vs. fixed releases
- Opening possibilities for peer production (internal) and user-contributed content (external) in authoring workflows

This list begins to suggest that the process of coming to content management touches nearly everything about the culture of writing in an organization beginning with how texts are understood and encompassing every step of the text generation lifecycle up to and including the way a text should behave when a user interacts with it<sup>1</sup>. An organization might need new software, new hardware, new personnel, new editorial policies, new training...all to make a culture of content management “stick.” None of these changes is immediately apparent to the organizations that we have worked with, however, nor does the proper mix of possible changes become clear to us, as consultants and researchers, except as a result of an inquiry process. And so we have found that we must find new ways to talk to organizations about these changes—not only about the mechanics, but also about the bigger picture implications—apart from the disciplinary language represented in the list above. A different list of what it means to come to content management, then, might look something like this:

1. Your website is not something you have, but something you do for, or even *with*, your clients/members/customers.
2. Your organization, as a whole, “writes” just as your organization, as a whole, must “do accounting.” Accountants make sure the organization and its members are doing accounting well, in ways that serve the interests of the organization, its customers, its stakeholders.
3. Your “writers”—those with specialized training in writing—must do the same for writing in your organization.
4. When people in your organization read, they are reading to write, and when they write, they are writing to connect with others inside and outside the organization to accomplish key organizational goals. Reading and writing environments supported by your organization should enable readers to write and writers to connect.

Our second list implies a very different way for an organization to think about CM: as a change in the technological and social infrastructure that makes their organization work. We will illustrate this change using two extended examples. Each example is also a report of research, by necessity, so we will present these accounts in ways that frame both the immediate practical (in the *phronesis*-informed sense discussed earlier) matters of concern as well as questions that can be taken up by other researchers. We will summarize content analysis and modeling methods developed for each project, but we are careful to offer these not as a set of proven best practices for CM but as research designs. Finally, we will report on the results of our inquiry and offer examples of our recommendations, designs, and reservations.

It is worth noting that each of the cases we discuss involves the management of content via the World

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<sup>1</sup> The list also sweeps up a lot of field knowledge in a compressed format. In making this list, we especially acknowledge the work of Albers (2003), Applen (2002), Clark (2002), Pullman (2005), Rockley (2001; 2003), & Sapienza (2002; 2004; 2007).

Wide Web. Web content management is often distinguished from "content management" or "enterprise content management" in two important discourses (Rockley, et. al. 2003). One is the world of content management systems marketing and specifications, where companies are marketed CM solutions that may only apply to their web presence or, alternatively, may include functions to support internal networking (Intranet) and other kinds of document and records-related management, workflow, and metadata. Content management is distinguished from Web Content Management in discussions of CM practices for large-scale organizations as well. What is assumed in both the product and practice-oriented CM discussions for large-scale organizations is a robust network infrastructure that can support the kind of differentiation of services (system functionality + human labor) required to make the distinction between content management and web content management meaningful. But for many organizations coming to content management, the WWW (along with a few other associated Internet protocols like smtp for mail and ftp for file transfers) *is* their network infrastructure. We will return to this point in the conclusion, taking up the issue of infrastructure and how small and non-profit organizations can begin to access the kinds of resources that have historically been available only to large-scale corporations and government agencies.

Presenting these cases to a disciplinary audience in this way is risky because they will never appear as nuanced or tailored as we hope they were when presented to the organizations themselves. Presenting them here, however, allows us to highlight opportunities and challenges technical communication researchers face in the area of guiding decision making for an important segment of the knowledge economy: the service sector. We offer our notion of coming to content management as a way of resisting CM as primarily a software or lower level management function. We have come to understand that CM is best understood as a way of constructing new types of relationships between and among actors and resources within organizations and stakeholders outside them; this view is guided both by Latour's conception of "tracing associations," and by our colleagues in technical communication who have proposed related and extended applications of Latour's (2005) actor-network approach (Spinuzzi & Zachry, 2000; Spinuzzi 2003; Johnson-Eilola, 2005). Coming to CM, as we understand, it is a deeply rhetorical process for organizations to undertake and, as such, it has implications for what technical communicators do as well as for rhetorical theory. We take up these implications after each case and in the conclusion.

### **A NATIONAL PROFESSIONAL ORGANIZATION ASKS "WHAT CAN WE DO TO IMPROVE OUR WEB SITE?"**

Our first case is what we would consider a "typical" content-management project in many respects. The client, a national professional organization (NPO), contacted us for assistance in understanding not only user problems with their web space but also to learn how to leverage the affordances of their web site in order to achieve organizational goals. The organization's executive director and web team both felt that the site was not serving the membership well. During our initial conference, however, it became clear that NPO was unable to fully articulate some overriding issues with respect to the website, and instead the client tended to focus on very specific, surface elements of the web space such as colors, types of images, navigation bars, and roll-over menus. NPO could pinpoint some changes they wanted to see, including a way to provide information for potential business alliances.

We came away from the meeting with one overriding wish from NPO: to have a web site that was engaging for their primary audience of current members while still providing an appropriate experience for future members and various other occasional but important visitors, such as policymakers and members of the press. NPO's vision was to provide a central area where members could respond to key issues. As the website also served as a store for publications and related items, they wanted this more prominent in the site. In addition, the organization wanted to leave space in their architecture for components and processes that were in the pipeline to be implemented at a future time. Overall, the client wanted to streamline the site and, at the same time, manage distinct functions and make the site more "content rich." They also wanted the project to be inexpensive. Usability testing at this stage was not an option, though they hoped that our work would help them plan and carry out more formal user research as they began to make improvements to the site. Our immediate charge was to advise the web team about how they should go about planning the improvements in the first place.

## **Our Framing of the Problem: Rethinking the Information Model for the NPO Site**

Our background research on the organization revealed that NPO was already providing services that fit the goals they sketched for their web presence. Specifically, NPO hosted two large conventions each year catering to the membership that provided a central location for members, prospective members, policymakers, and press to convene, share information, network, and purchase items. NPO understood the conventions as an important part of their services to members, perhaps their most important service alongside traditional print publications. From our point of view, the organization was beginning to realize that they wanted their web site to function persistently as their conventions functioned for two weeks each year. This was not immediately apparent to NPO; furthermore, the implications were even harder for NPO to imagine.

What our team realized about NPO's conventions was that they operated with a very different information model from the web site. The amount and type of information that one might find in these two venues were different. And, even more dramatically, the ways information was created, published, and distributed in the two venues were different. The conventions were locations that engaged the membership in creating and sharing information. NPO's role was to facilitate this by providing infrastructure, staff support, shared guidelines, and even awards and incentives. The information model that drove the conventions could be summarized as members coming together to share knowledge with one another, with policymakers and members of the press, and with vendors associated with products in the industry. When we examined the organization's web site, however, we saw very little evidence of member activity at all. This absence of member activity became our investigative focus for the project.

## **Analysis Methods for the NPO Case: Content Audit & Content Lifecycle Mapping**

One of our key questions for NPO was deceptively simple: just how did articles and content on the site get published? Was there a protocol? Was publication centralized? Was there any silo effect (Rockley et al., 2003) taking place among organizational entities? To get at an answer to this broad question, we first needed to make a list of the content types represented on the NPO site. Following Rockley et al. (2003), we began with a content audit that allowed us to identify content types (understood as genres) as well as views, or on-screen contexts in which users encountered those genres (Hart-Davidson, 2005).

We made sure to explain our analytic procedures to the NPO web team because we wanted to establish a common language to discuss our results, and we hoped to discover how their own ways of conceptualizing, creating, and maintaining the site had helped to create the version of it we were seeing. Our goal for the content audit was to begin to see patterns, including the range of variation within and across content types, and any attempts made by the web team to normalize and standardize those. We had similar goals concerning the range of variation of view types. Our initial meeting with the web team and our own preliminary evaluation of the website made clear that some user roles were not well served by the views that were present, but we wanted to understand why.

In our next round of discussions and e-mail communications with the NPO web team, we posed scenarios that invoked the content types we had catalogued on the site, asking the web team members to imagine how one or another user, in a particular role, could achieve that user's goal. Our aim was not to use these characterizations as a substitute for user testing or to in any way stand in for user expectations. Rather, we wanted to understand the prevailing expectations held by the web team themselves. From the scenarios we posed (for example, "imagine you are a new member who wants to find out what other members in their specialty area are doing; where would you go?") we learned fairly quickly that just framing a scenario like the one above helped to demonstrate the degree to which the site's current content model was out of synch with the organization's goals for the site. We understood that our goal was to help NPO to begin to understand and to strategize a conceptual change for the function of their website. Where it had previously been something the organization made (edited, published, etc.), it was destined to become something that the members made. Where it had previously been a kind of product, it was morphing into a collection of services to the membership.

With the strategic goals clarified and agreed to, our project moved into a focused research phase. Our

specific research questions were designed to help assess not only the current state of the web site but how well it was or was not meeting the needs of members.

### *Research Questions*

To gauge the usefulness of the current web site and identify the needs of members, we asked the following questions:

1. Who are the organization's users?
2. What is the current user experience like?
3. What is the number one job of the organization's main page?
4. What are the main user roles, goals, and tasks?
5. What are the main views and content types?

A sixth question, unstated, summarized the message of our key deliverable: how can questions 4 & 5 be best put together in order to achieve organizational goals?

### *Methods Used*

We were working with a very short timeline of just a few weeks and, as mentioned above, we were limited to the site itself and the web team as our data sources, with no direct contact with organization members. We decided to conduct a full content audit (Rockley et. al. 2003) and what we have termed an "objects and views analysis". The former is a straightforward list of the content types available on the site, organized by genre. The latter is a different view of content that complements what can be a rather static, product-focused "inventory" of text types. A "view" is a collection of content objects presented to the user in a coherent visual format (Hart-Davidson, 2005). Screens and pages are not necessarily the same as views, as a single page can consist of multiple views. An objects and views analysis is an attempt to account for where content types show up, in what formats, and with what other information and interface widgets. Content, in this sense, provides evidence of NPO's activity and of the web team's expectations about user activity. Content is seen less as a product or products to be delivered in this process. A focus on genre-theoretic analytic principles (Orlikowski 1996; Yates & Orlikowski 1992, 1999, 2000; Spinuzzi & Zachry 2000; Bazerman 2003; Spinuzzi 2003) helped our team to stay aligned with a view of genre as social action, with the textual artifacts/forms we encountered representing something like the "fossil record." When we found, for example, more than twenty different types of menus, our analysis turned to identifying what about the organization's approach to authoring and maintaining the site encouraged these forms to proliferate and dominate the overall browsing experience.

We presented NPO with the preliminary results of these analyses during a conference call. Our aim was to say, in effect, "here is the current information model that you have," and to get clarifications, questions, and other reactions from the web team. Prior to the presentation, we prepared a list of categories of content types and a list of views that made up the site. Each team member then took charge of certain categories and views and completed a thorough analysis, locating any examples that showed up anywhere on the NPO web site. Examples of content types we derived include

- News & Announcements
- Forms
- Materials that users can implement in their everyday jobs
- Policy Statements
- Features/Perspective on Issues

Some of the different view types included

- Menus
- Search Results
- Forms
- Article/Feature/Materials Detail View

## **Results of Our Content Audit and Object/View Analysis of the NPO Website: Finding Destination**

## **Content**

The purpose of the content audit was to hold a mirror up to NPO's website for the organization in an effort to visualize with NPO how their content served their strategic goals. We encouraged them to see their site as a means to accomplish important goals such as providing member information and services and providing information to the press and to policymakers. As our lists of content types grew, we were able to show the web team how the ability to appeal to the audiences associated with their strategic goals might be affected. Based on the browsing experiences of these users, we could discuss what types of relationships NPO was constructing or attempting to construct.

The organization's web team was somewhat surprised to learn that while the audience groups as a whole were coherent (members, press, policymakers, etc.), a typical user session may actually involve a user inhabiting a number of distinct roles that better describe the way they expect the site to perform for them. For this reason, we stopped referring to users as members of this or that audience, and instead framed our discussion with the concept of "user roles." The concept of roles was useful because it allowed us (and NPO) to focus on goals, tasks, and specific (non-permanent) identities. For example, a user might only be a "member" when they need to access member services, pay their annual membership fee, or register for an organizational event. Other times, they may be using the site as a "working professional" seeking the latest information about their particular work area. Users might also find themselves being "shoppers" at various points of a use session. But these roles are not exclusive. They can overlap, or one can morph into the other and back again. What our demonstrations of role-typical browsing behavior showed the NPO web team was that the old site architecture did a poor job of orienting users according to role, goal, and task.

For example, as mentioned above, we found that the user experience was dominated by menus. In particular, one of the most common and visible content types provided to users by NPO was navigation, forcing users to drill down, layer after layer, until they finally came to useful information. Most page views took users to more menus, presented in a variety of ways: as lists of links in the body of a document, as drop down menus in the header, as area-specific navigation links in the left margin, and as sidebars of additional links. The procession of menus made the site seem more complicated than it really was. However, if a user was persistent enough to click through the menus, some valuable "destination content" could be found. We separated out the destination content into the areas outlined above: news, forms, materials for users to implement in daily practice, policy statements, and perspectives on issues. These content types, moreover, were typically produced by the organization's members themselves; that is, by the intended users of the site. In the end, and despite the apparent visual complexity of the site, we found that the organization published just seven main types of information.

With a better sense of content types, we started to see how the site could be made much more responsive to user needs, starting with the main page. Our investigation found that the primary goal of the main page was to help users across all roles get and stay informed. While plenty of useful links and menus appeared on the main page to help users reach this goal, too many other kinds of links and information also appeared on the main page that competed with the priority goal of the interface. Moreover, no "destination content" associated with the goal of "getting and staying informed" (e.g. news items) bubbled up to the main page.

## **Recommendations, Designs, Reservations**

Our main recommendation was that NPO needed to commit to revising the website to reflect the most important goals and tasks of the users, rather than the structure of the organization. For the average user, the structure of the organization is irrelevant when attempting to complete a task. Instead, the user wants the site architecture to be constructed so as to make their tasks easy to accomplish. We resisted giving the client a tight design scheme since the web team was only seeking guidance about how best to proceed at that point. We instead gave the client a window on what an individual chunk of information looked like. Our recommendations focused on six user roles, though in talking with the members of the web team we came up with many more. Some of these additional roles were not terribly clear to us because they required a level of reflection by users themselves, to whom we had no immediate access. But what was useful was

understanding how the web team saw particular tasks grouped with those roles. We helped them to see how they might design views that would highlight information for specific users and tasks, while shielding things that were not associated with the role. We found design examples from other organization's website and showed these to the client to illustrate our points. We also were sure to explain to the client all of the existing strengths of their website, and we made suggestions on how they could build on those strengths.

We recommended that the best way to quickly and efficiently meet the needs of each user accessing the NPO site was to be sure that the content they saw was uniform but customized for the needs of each role. Because each user needs a customized view, but simultaneously needs to be able to quickly change roles and thus requiring different views, we recommended collecting materials on "landing pages" that corresponded to user roles and actions. In our report, we provided mock-ups for the client that illustrated both role-based navigation and user-based navigation. A member services landing page, for example, could allow users to check their membership status, register for events, and access the member contact database.

The final deliverable for this project was a forty-page report. Ultimately, our recommendation report was intended to be a resource for deliberation meant for the organization's web design team and with the administrative team and the Board of Directors. Where the organization had clear design goals, we made specific recommendations; where the goals were less clear, we attempted to frame the issues in terms of best practices in information architecture, interface design, and content management, all in light of user needs and organizational goals. We made clear in the report as well as in our conversations with the client that we remained dedicated to helping the company succeed by clarifying and/or elaborating on our recommendations.

### **Changing NPO's View of their Site: How Can You Help Your Members Make & Share Content?**

One of the challenges to doing this "typical" CM work is to see beyond how the client articulates the initial problem in order to view the bigger picture. Understanding of basic usability considerations help in this regard, but in this case the way the site functioned (or malfunctioned) was as much a matter of the organization's view of the site vis-à-vis their mission as it was due to technical or design problems. What would their website do? Would it simply be a reflection of their organizational chart and a place to post information? Or would it become a means, if not the primary means, to deliver member services? This was the decision we tried very hard to foreground and provide enough information for the client to deliberate upon.

Another challenge our team faced was to be realistic about what resources and existing content/architectures the client already had to work with. While it can be helpful to make blue-sky recommendations in order to broaden a client's view of what is possible, it is also wise and useful to provide the client with ways to pragmatically work with existing materials. We had to stay focused, in other words, on the good of the community and not just on making a good web site. Perhaps most importantly, the intent of our recommendation report was to help frame and inform conversations internal to NPO. In helping them come to content management, our goal was to serve as a resource for their strategic thinking about who wrote with and for the organization, who accounted and supported this writing, and what role the website plays in the larger mission of the organization.

In the NPO case, we came to the realization that the meaningful (or what we called "destination") content on the site was almost entirely produced by the site's users—that is, by NPO's members. Our analysis of the site's content, then, was a means for NPO's professional staff, executive team, and web team to see their users in a different way: as content producers, rather than as consumers. This was a major shift in focus for NPO, and one that took several rounds of meetings to flesh out.

Our content audit and objects and views analysis of the NPO site was an examination of user activity in an attempt to understand what, in fact, the current infrastructure was or was not supporting in terms of user goals and actions. We were very focused on users, doing serious user research, but this was very preliminary work in the overall lifecycle of the site re-design. We would argue, in retrospect, that had we jumped into conventional user testing with tasks that flowed from the old users-as-consumers-of-



information model, we might have recommended incremental improvements, perhaps, but we probably would have come nowhere close to the re-imagining of the organization's core mission and the website's relationship to it that we think we actually did begin to see toward the end. NPO's executive director said almost those exact words, noting during a conference call that we were showing them a whole new way to use their site to serve their mission.

We believe there is an important issue here to explore related to the nuances of "user research" and to the concept of CM-as-conduct we introduced earlier. The clients we worked with in the NPO case (and to some degree in the Library case that follows as well) were charged with supporting a group of site-contributors (or potential contributors) who are their users/members. Their design decisions were not only about making a good website, but also about supporting the "making" that their users do on and via the site. If we pursue user research in a more traditional mode, where users are thought to be primarily consumers of information rather than a community of people who write and share information, we might well cast users in the wrong role (wrong goals, wrong tasks) to learn about the best ways to transform organizational infrastructures such as web sites meant to allow users to share, organize, or otherwise create content. We might lose sight, in other words, of the "good of the community" that websites, as infrastructure for users' writing practices, are meant to foster.

## **CASE 2: MICHIGAN STATE UNIVERSITY LIBRARIES**

The Michigan State University Libraries asked for our assistance in their efforts to transition to a new content strategy that aligns with a redesign of their website. While our work for NPO led to a discovery of the roles users could play in their content development process (users as editors, users as contributors, and users as curators of content), the Libraries came to us having already arrived at this user-centered view, believing that users could contribute to their online resources. To help them implement this belief, we investigated the Libraries' current methods of content production, observing writers and the roles they play inside the organization. Arriving at an understanding of the current content development practices was essential before we could make recommendations as to where user-generated or user-moderated content might fit into their development process. When we were approached by the Libraries' web team to work on this project, one of their initial concerns was how the existing structure of the site might be confusing and/or difficult to use at "level 2," or the set of resources accessible directly from the home page.

### **Our Framing of the Problem: Allowing Users to Manage and Create Content**

Our focus in this project eventually led us to identify areas of the Libraries' site where users could contribute content. We were able to focus on areas of the site in which users could customize their own views of content and arrange content in ways that made sense to how they viewed the purpose of the site. At the beginning of this project, we agreed that we would not focus on what is probably the most common of all user tasks across all user roles: search. Because the Libraries had another significant project underway to study and refine the ways it assists users in searching, this report did not focus on the search-related pages (simple search, advanced search, search results, etc.) that are, we acknowledge, a very important part of the overall user experience on lib.msu.edu.

### **Methods Used**

Three student research teams completed the following types of inquiry:

1. A content analysis, helping us to survey the "inventory" of content types that comprise the Libraries site, as well as where and how they tend to show up;
2. An objects and views analysis, yielding an assessment of the current site's "level 2" pages; file structures, traffic patterns, and content and layout of specific pages were examined to discover how the site was able to grow and change over time; and
3. A workflow analysis, yielding an assessment of current content development practices as well as

ideas for how these might change to better serve staff as well as to prepare for more user involvement

In order to investigate the ways the Libraries users were using the website, we created a task survey. We gathered information from undergraduate students, graduate students, and faculty during visits to the main library branch. To examine the current roles and workflows of content developers, we performed a survey of content developers in which we asked them to describe 1) their job duties and responsibilities, 2) technologies used in current development, and 3) formal and informal structures that influence their development work. We initially distributed the survey to four staff members who indicated that they had a hand in content development as well as the editing and development of the website or page. Based on our preliminary findings and conversation with Libraries staff, we then sent the survey to another four developers who were designated as being content developers who are not necessarily directly responsible for posting content to the Web site.

We also conducted an analysis of all first and second-level landing pages available off of the Libraries home page, investigating the source code of the pages to identify development technologies and the names of page editors, if indicated. Without access to the history of the site's development (we had little more than the source code to go on, initially) or complete knowledge of development strategies pursued as the site evolved, it was sometimes difficult to correctly identify the technology being used. For example, it was difficult to identify all the pages where PHP was used to generate HTML pages because we did not have access to the server. Our analysis did, however, allow us to identify trends among content development technologies used such that we could create a list of specific technologies employed to maintain each type of content, as discussed further below.

## **Results of Inquiry**

We concluded that many of the content management issues the Libraries faced were in effect "growing pains" resulting from the expansion of their website over the years. Moreover, we identified a mismatch between how the Libraries had organized and presented their content and how users conceptualize and carry out their work on the site. In addition, we were able to pinpoint breakdowns in the creation and maintenance of content that were related to the growth of the site. We describe this below in terms of three specific findings.

### **Finding: lib.msu.edu Shows Significant Growth**

Our first attempt to understand the structure of the Libraries site was to look at the homepage, its menu, and its links. During this analysis, we established the site's structure included both the main library and sub-domains that existed on their own server(s). Through our interviews with staff, we learned that they had moved from a webbed structure to a more hierarchical structure in the past, but because many of the former links were preserved, content developers now saw the website as a combination of the two forms.

Moreover, by analyzing the Libraries' traffic data we determined that the website consisted of two distinct types of landing pages—Library Services Pages (LSP) and Autonomous Destination Pages (ADP). LSPs contain information about library services, branches, and programs, while ADPs function as more-or-less stand-alone "destinations" for users. The traffic data allowed us to see a much more orderly picture of the site's growth and structure. The ADPs in particular seemed to be stifled by efforts to bring the LSPs into a more coherent look and feel. By showing the staff that these two kinds of pages were different in terms of user traffic, we were able to discuss how different content strategies might be pursued for LSPs on the one hand and ADPs on the other. We showed how ADPs could adopt content strategies that invited user participation in much more robust ways without putting the overall coherence of the site in jeopardy. Eventually, we were also able to argue that allowing users to login and customize LSPs could achieve a similar aim. First, however, we had to convince the staff that their website should not be a reflection of their hierarchical organizational chart.

### **Finding: Users Have a Different View of the Site**

When we compared the results of the user task survey to the analysis of the site structure, we saw a mismatch. There was little correlation between the most commonly pursued tasks and the main site sections or even links from the home page. While we recognized that more research was needed to determine exactly what users' goals and expectations might be across all user categories, our analysis suggested that the current site did not reflect users' demands very well. In many ways, this finding was similar to our work with NPO: the structure of the site as understood in terms of user tasks was different from the structure of the site as understood by the library.

Because the lib.msu.edu site mirrored the Libraries' Organizational Chart, a user's first visit to the site requires her to navigate using terms that correspond to the division categories already established. In response to this finding, we took an in-depth look at two of the second level pages on the site with the most frequent traffic, one being the services page (an LSP) and the other being the grants page (an ASP). After examining the pages by using a card sort for three different audiences (undergraduates, graduate students, and faculty), we made a determination that the navigation and content on these pages did indeed reflect their organizational chart rather than a structure that related to user expectations for the page.

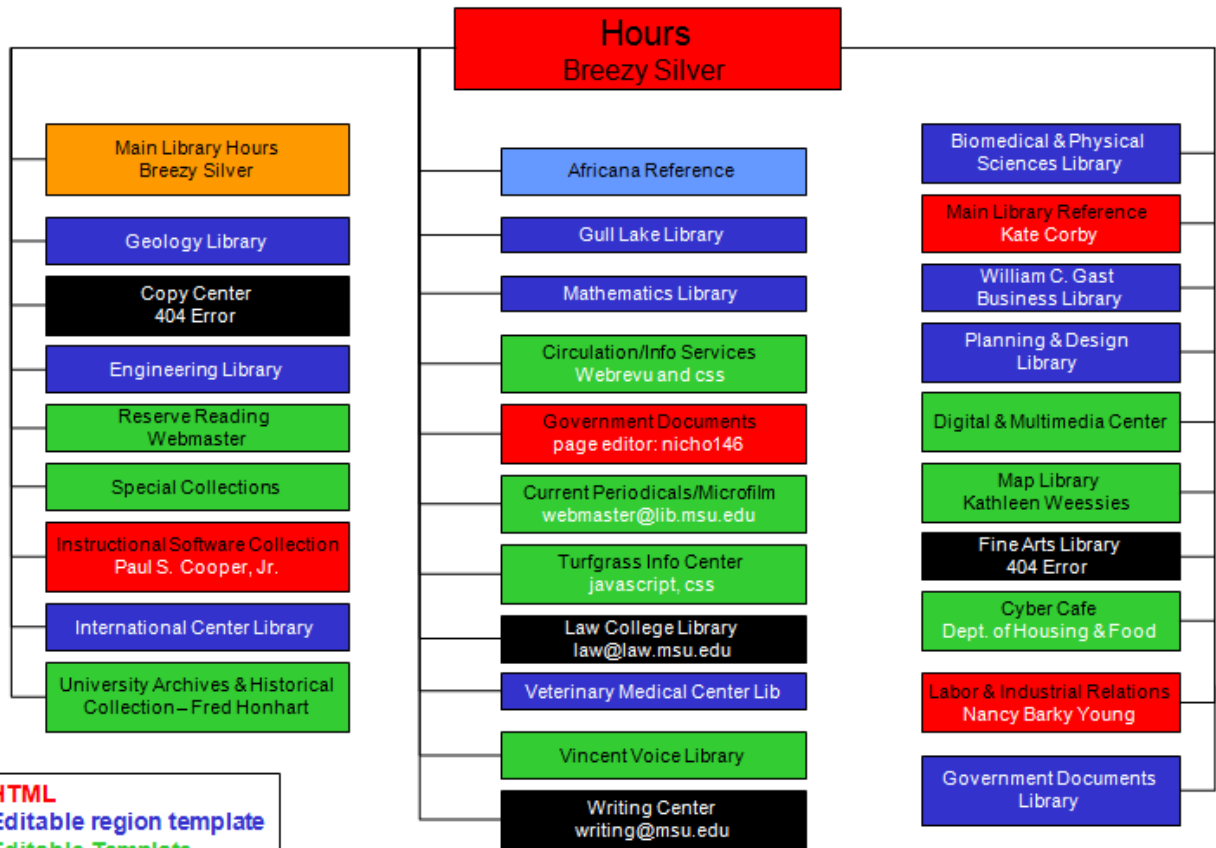
Our card sort also revealed that undergraduate students had difficulty determining the definition of certain section headings used on the site. The term "Circulation" seemed to be a term that many struggled to understand, influencing their difficulty to predict the contents of a page with that heading. Moreover, most undergraduate students wanted to place items in the sort under a "Help" category. Overall, our card sorting and task survey analysis revealed a common theme: users are task-oriented when using the website. Users generally enter the site to search for a journal periodical or to check on their library account. In addition, many of the graduate students and faculty surveyed enter the site to find information about grant-related content. When they categorize information, they want and expect categories that map to their goals and tasks. Undergraduate users expected "Help" to be available from any landing page, for example, because they have a goal in mind and often need assistance to accomplish it.

### **Finding: Workflows are ad-hoc, influenced by technological know-how, and disconnected**

Our investigation also focused on the current roles and workflows of content developers, and our findings here are complex, as workflows are influenced by a number of factors, many tied to the diversification and growth of lib.msu.edu over the years. Our research indicated that outdated and unclear institutional guidelines lead to workflows that are heavily influenced by access to and understanding of content development technologies. Further, intermittent communication between developers and across departments was reduced timeliness in the creation and deployment of content.

First, from our conversations with Libraries staff and their responses to our survey, we observed a need for structured training, templates, style guides, or development procedures for writers to follow. While one staff member did reference and provide a copy of an older style guide from 1996, staff members generally agreed that workflows are not governed by any formal rules, and this absence of formal guidelines results in ad-hoc "rules."

Second, our analysis of the technologies used to create content revealed that while the development of Web content did not appear to be guided by formal procedures, the development of different pages did seem to be based on the level of expertise and job responsibilities or physical location of staff members. Our survey results indicated that a range of technologies—including Microsoft Word, Dreamweaver, LibData, Notepad, and ColdFusion—are used by staff when creating and updating content. The charts below demonstrate our analysis of one of the first and second-level landing pages accessible off the Libraries' home page, demonstrating the range of technologies used. We explained that the diversity of production tools and development environments was not necessarily a negative, but could pose problems when the choice of tools and environment is not made for strategic reasons but rather for reasons related to lack of awareness of other systems, lack of training, or limited access. Fig. 1 represented the current editing tools and work responsibilities for one of the more heavily-trafficked pages on the website. Figure 2 represented our recommendations for transforming the workflows.



Breakdown of workflow technology implementation for 2<sup>nd</sup> level landing pages within "Hours" page.

Figure 1. Current Workflow for "Hours" Page

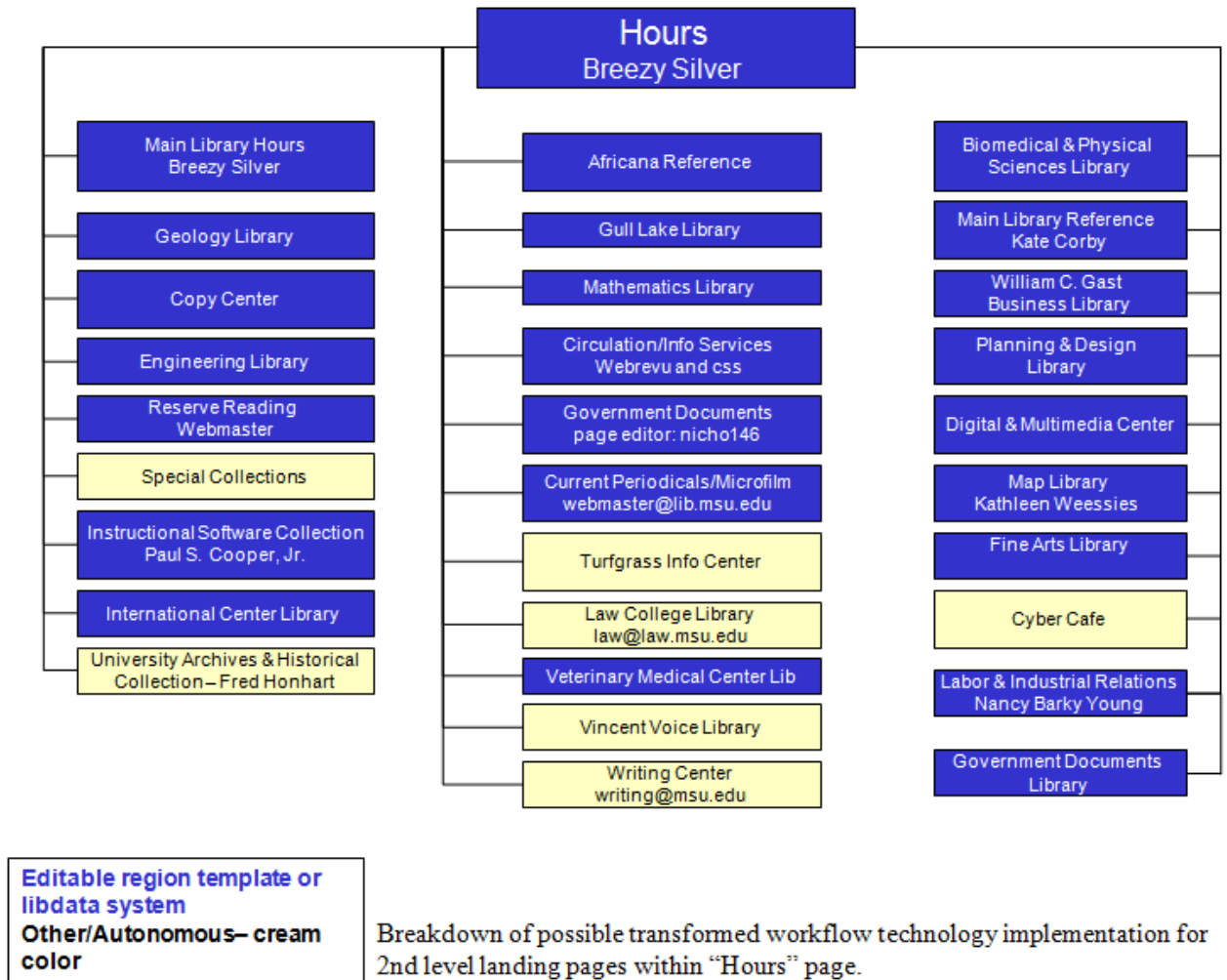


Figure 2. Transformed Workflow for "Hours" Page

Third, we observed that there was minimal communication between developers and across departments, which made writing less efficient and timely. We suggested that the diversity of possible technologies used for developing content may also be related to the minimal formal communication avenues available between developers. While some staff members did indicate turning to other staff for assistance during the content development process, it did not seem as though staff had the means for communicating with each other to share knowledge regarding either technical assistance or content development. Asked to describe the strategies and workarounds they have developed, staff members noted limited interaction between content developers, but it was mostly in the form of copying one another's work.

### Recommendations, Designs, Reservations

Following our analysis of the genres, delivery methods, and workflows in place at the Libraries, we offered two global recommendations, both of which were meant to foster an overall conceptual view of lib.msu.edu as what Nardi & O'Day (1999) term an "information ecology," a metaphor that allows us to highlight issues of sustainability and diversity as important goals for the growth and maintenance of the library site.

The first global recommendation was to make explicit the content strategies, roles, and work patterns associated with the site as a way to embrace an ecological approach. Our second and more progressive recommendation to the Libraries web team was to focus on how users could become more than just

consumers, but also actual creators, editors, and manipulators of content. Our analysis of the site revealed that the only way to ensure that the Libraries can remain a vibrant and central aspect of the university experience for students, faculty, and staff is to rely on users to contribute to the information ecology in meaningful ways. We indicated that the web site is the means to this exciting end. Users, as active participants in the ecology, help it to grow and change by creating, editing, arranging and indexing content, all with the guidance of what Nardi & O'Day (1999) recognize as the “keystone species” of library ecologies: librarians.

From these global recommendations, we offered several specific recommendations:

1. The Libraries should create user role-based views that act as “landing pages” for target user groups. Ideally, these views would reflect the goals and activities of users. In the short term, these might be designed as role-based views. In the longer term, more dynamic views created from aggregating user choices or even user-customized views could be implemented.
2. Currently, the most visited pages on the library site are of two distinct types: one type that contains information about services, branches, programs, etc., and another type that stands apart from the main library as a stand-alone “destination” for users. Rather than think of these as links from the home page –as “level two” pages that are static – the Libraries should consider how best to integrate library services information into role-based views. Stand-alone or destination sites need to develop user profile information of their own and provide role-based landing pages that suit their users goals and activities.
3. Content development, review, and maintenance practices within the Libraries need to be made more explicit in order to ensure that the diversity of development tools and environments in the library ecology are used wisely and strategically. The Libraries should undertake a process of self-study to understand and fine-tune production and content management processes associated with the services pages as well as the autonomous unit pages.
4. Having described in detail the content development strategies already functioning within the Libraries, we identified a number of areas where users could potentially contribute as authors:
  - Allow users to contribute reviews and comments on appropriate content types such as catalog items, research guides, etc.
  - Consider staff member blogs that allow individuals to contribute updated info about their areas of expertise and to aggregate posts from other sources about issues and events.
  - Make content from the catalog holdings easier to get via lib.msu.edu by showing popular or recent searches, top journal holdings, etc. in lists available from users login or welcome pages.
  - Consider explicitly licensing some or all of the library-created content using a “some rights reserved” license that provide protection against unlawful commercial use, but open up the possibilities for educational use. With broader circulation, library research guides and other materials could circulate widely and boost the credibility of the MSU Libraries as the source for this knowledge with faculty, with policymakers, and with students and parents.
5. We identified several methods or areas of the site where users could function as curators: as indexers and organizers of information. No matter how carefully items are indexed and categorized, new topics and even new projects initiated by users will always challenge existing categories in a vibrant, knowledge-sharing community. Allowing a system of bottom-up tagging, sometimes called a “folksonomy,” to co-exist with the top-down “taxonomy” that constitutes the traditional structure is one way to address this issue.
  - Allow users to “tag” destination content on ASPs as well as resources in the catalog with keywords, rate it for value, and recommend it for circulation specific user groups within the MSU community.

- Collect all of the “free” user data possible from the site databases and use it to construct or feed collaborative filtering (a.k.a. recommender) algorithms that highlight such use characteristics as frequency (e.g. the most accessed content item of a given type) and affinities (e.g. people who viewed this article also looked at...).
6. We also identified a number of content areas where we felt users could create customized views depending on their needs that could then be repurposed to serve the larger community:
- Allow users to compile their own pages that consist of resources on lib.msu.edu, based on the issues that matter to them. These could initially take the form of pages for specific user groups, library-sponsored projects or units, with designated editors who were accountable as the heads of these initiatives. Eventually, we also imagine this feature being open to all users (the natural example here is for faculty to create course-based groups). The result would be much like the formation of Special Interest Groups, with some topic-driven and some community-of-practice driven groups sharing common resources.
  - Provide RSS feeds for destination content types, unit news and, as they come online, user-aggregated pages. Providing RSS feeds for existing content types and categories (e.g. Special Collections>Comics) would make user-aggregation of content easier because users could create dynamic modules for an aggregated page simply by subscribing to one or more feeds.
  - Feature user-aggregated pages on the lib.msu.edu main page, recognizing the best examples of users adding value to the site and serving the community by being volunteer editors.

### **Opportunities and Challenges for TC Consultants**

This Libraries case, like the NPO case, highlighted opportunities for our client organization to put a more significant focus on users as key creators of content. With greater access to users, we were able to be more detailed in our recommendations about the ways the site could allow users to interact with existing information available through the library site in order to increase the overall usefulness of lib.msu.edu. The focus on user-driven activity in the Libraries case understandably became as much about how users could serve in roles akin to editors, reviewers, and indexers as much as originators of content. These kinds of services are the traditional domain of librarians, of course, as they tend to add value to a collection of resources—books, periodicals, reference materials, etc. When we began exploring what kinds of user activity could also add value in these ways, it led us to focus on the staff as well, especially the roles that staff writers and editors played.

A significant challenge in this case was to identify production methods that the staff could use that would allow users to play a central role in the creation and maintenance of content. How could a balance be achieved? What we saw when we observed the development of content was an information ecology that had developed with an entirely different, asymmetrical relationship between librarians and users. The ad-hoc workflows and complex mix of authoring tools worked fine for a vision of the lib.msu.edu that was inhabited, in a content-production sense, only by staff members. “Behind the scenes” of the site could look like “behind the counter” of any office...messy and complex, but manageable for those who work there. Once the idea of allowing users to perform some production tasks previously done only by staff was raised, however, questions about how those tasks currently were performed, by whom, how often, and with what tools had to become much more explicit.

As more organizations extend invitations to their users to contribute content, we see a need for making methods of production explicit, a job that technical communicators are particularly well-prepared to do. If we are to help organizations make these large-scale transformations that run as deep as their fundamental mission, we will need to help even those in favor of change within those organizations to make strong arguments for the value of writers and writing practices. Organizations must become aware, as they

come to content management, of their responsibility to nurture the development of writing as a mission-critical work practice. This is a view of CM, once again, that understands the set of transformations associated with allowing users to create content as a move to ensure the health of their organization, as a move meant to ensure the good of the community.

## CONCLUSION

The impacts of larger-scale organizational dynamics like “knowledge management” and smaller-scale changes in writing practices such as single sourcing are still not well understood within technical communication. While the dramatic changes promised in the early literature on knowledge management have shown up in uneven ways in organizations, all organizations have to deal with how to manage relationships between information and people. This is not easy work, and the role of communication and technical communicators within this work remains unclear. Similarly, we are still watching quite fine-grained changes in writing practices due to single sourcing, localization, and standards driven content development. Here again, it is still unclear if these changes will result in a “deskilling” of writing work. If there is any area of work where the careful attention of groups of researchers is needed, it is on writing practices at places and times where these market, organizational, and rhetorical vectors intersect. Our presentation of two such instances is meant to spark further inquiry into these important issues.

Indeed, our work on these rather tightly bounded research projects leads us to such unbounded reflection. We believe that the transition to a service economy as described in Castells (1999) involves a change in the writing culture of organizations similar in impact and scope to the changes documented by Yates (1989) in her study of the shift to systematic management in the American railroad and manufacturing sectors in the mid-eighteenth and early nineteenth centuries. Attending to and fostering productive change in the writing culture of organizations requires expertise at the intersection of two strengths of our field: workplace writing research and usability/interaction design. In fact, we have high hopes that the set of difficult problems presented by complex knowledge work distributed across an organization means that all organizations who must come to content management and must come to it as a rhetorical problem (though few will use this language)—and therefore a problem of organizational identity and strategy—and not precisely as a problem of technique or technology alone.

Consider again the origin story of both cases presented in this article. Both organizations came to us for help with their websites, but they came to us not because they understood us to be experts in web design and development per se. They came to us because they understood us to be experts in writing and because we are researchers. It is true that the project that resulted in each case was dramatically different from what each partner organization anticipated, but they still understood, even tacitly, that the problems that they thought they had were complex and not easily solved. If the sorts of problems that each of our client organizations were confronting are larger trends, we see promising implications for technical communication:

*Workplace writing research may be a valuable aid to transforming organizational cultures.*

The core expertise that organizations seem to value in us is our ability to conduct writing and communication research—to identify problems and develop inquiry strategies intended to guide the design of workable solutions. Our graduating students, too, seem to be leaving us to take positions in which their ability to conduct research and turn results into communication solutions is most valued. They are valued as strategic—rhetorical—thinkers whose job it is to help their organizations write better, not precisely to write for their organizations (although they often do this, too). As we prepare our students for the workplace, we plan to teach more of the concepts and methods that arose in the two cases presented above, across more of our courses in the undergraduate major and the graduate programs. We will also cultivate relationships like the one that permitted us to work with the Libraries to develop a project that, while valuable for the client, was just as valuable for students as a learning opportunity.

*As the web itself is transforming into enterprise software for small business and non-profit organizations, technical communicators are well-positioned to provide the critical services that usually accompany shifts to new infrastructure.*



For us and many of our colleagues (Clark, 2002; Albers, 2000), content management as a phenomenon and a practice raises critical issues about the kinds of service professionals (or service workers) technical writers are becoming in the economy. Thus, while these cases offer encouraging narratives of how organizations might think about how to come to content management (seeking help from researchers with expertise in technical communication), they also speak to the tenuous position that writing-as-a-practice (and the writers who care for it) occupies in every knowledge organization. Writing is infrastructure, and thus it is both fundamental and invisible. We “see” writing in critical times of transition like those narrated in the cases above. But for many other organizations, writing practices are not so obvious and nowhere near the list of mission-critical activities. This means that our expertise, too, is off the radar screen. This is why it is true, we would argue, that while the moment of coming to content management may well give us an opportunity to prove ourselves valuable, we also need to be careful to develop sustainable ways of coming to content management that can make writing work visible and accountable as part of an organization’s thinking. This is particularly true, we would add, for organizations like the not-for-profit, service-oriented organizations who were our clients. For these organizations, the lure of the web-as-infrastructure is powerful because it is free and they have, by definition, scarce funds to spend on technical resources. But the web also comes without clear ways to define what writing practices work best with and for an organization. Doing that critical work is, perhaps, up to us.

#### ACKNOWLEDGEMENTS

The authors wish to thank the client organizations for their permission to publish the results of research on/with their staff, membership, and users. We would also like to thank the members of the Spring 2006 Advanced Technical Writing course, WRA 420, at Michigan State University for their work and insight on the Libraries project: Nick Baumgardner, Grace Bernhardt, Felicia Berryman, Amy Diehl, Larry Hall, Katie McAlpine, Michael McLeod, Jeff Smith, Sue Webb, & Casey Wright. Finally, we are especially grateful to our anonymous reviewers for their helpful comments.

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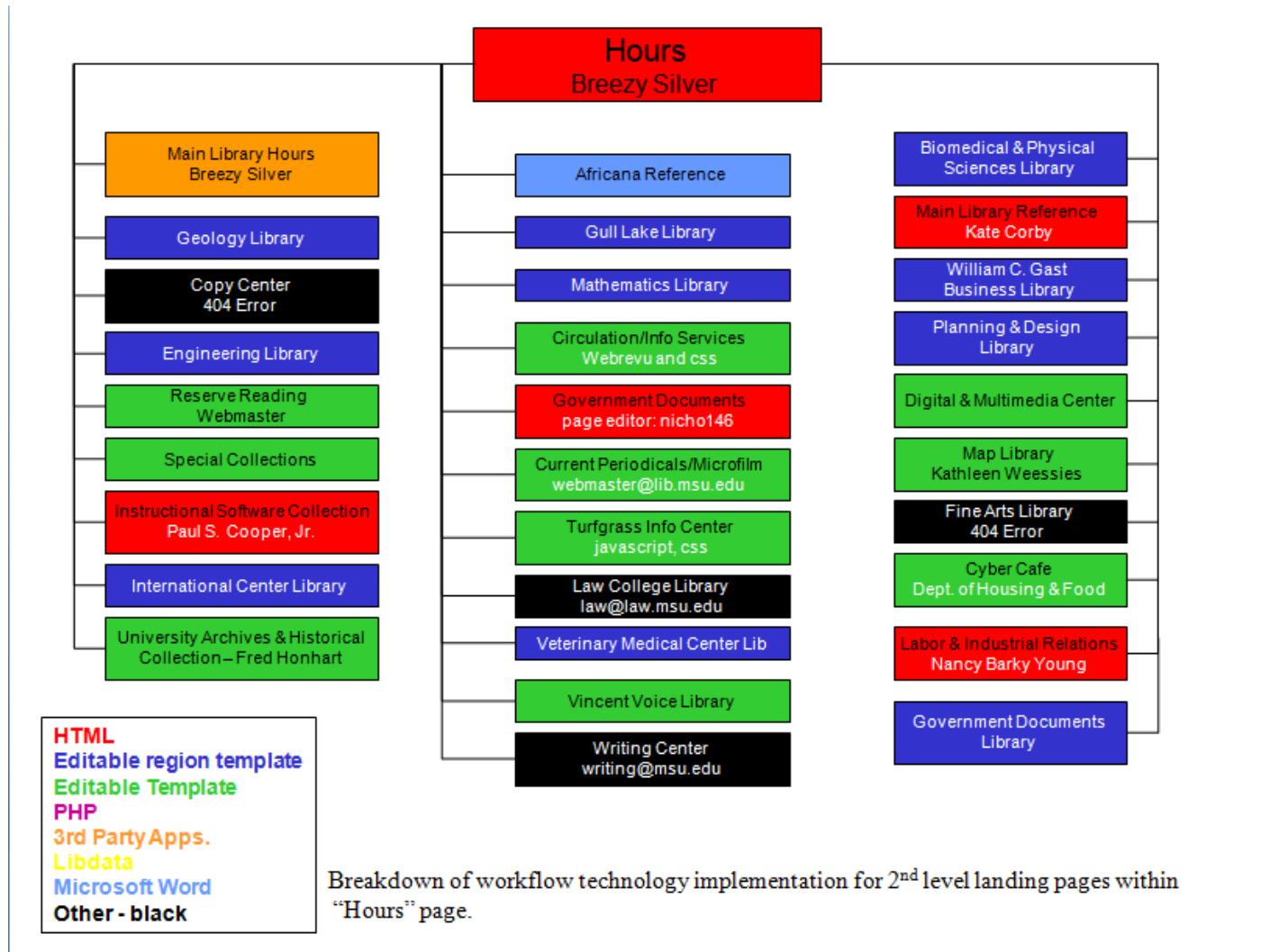
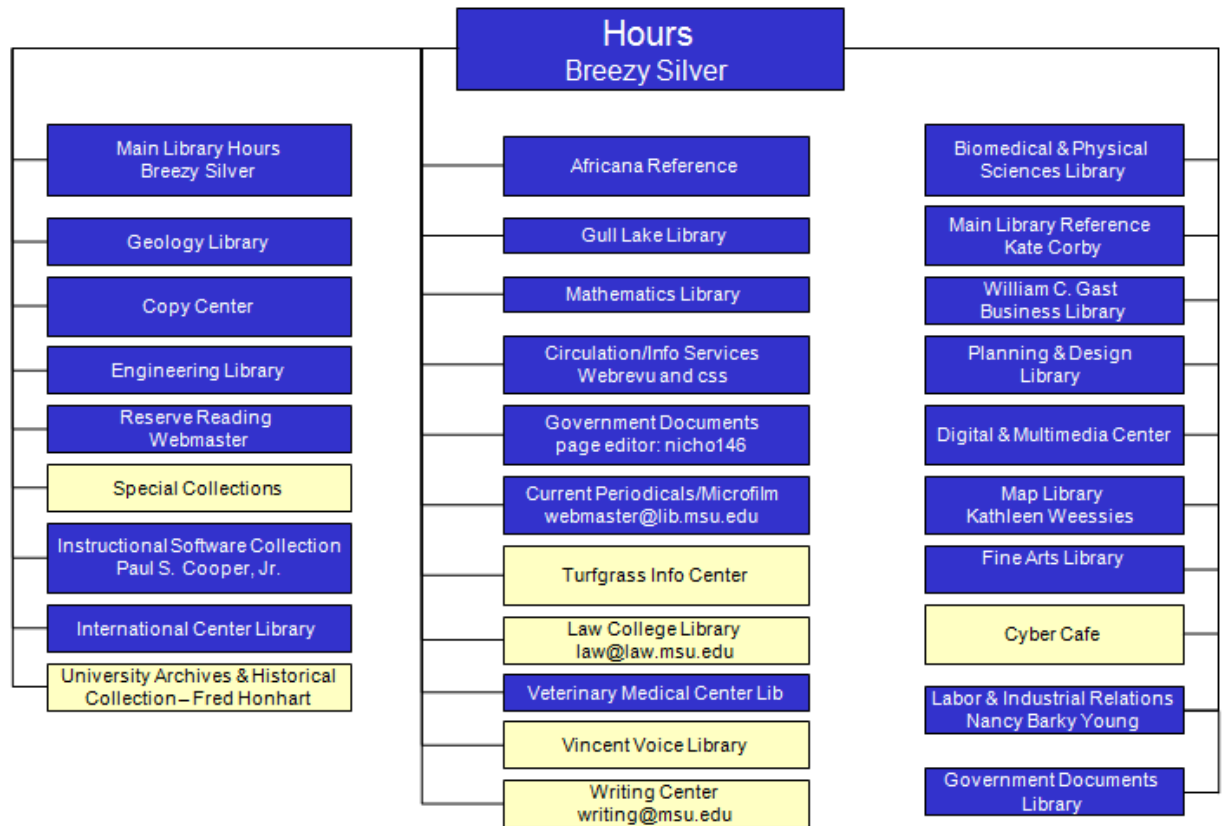


Figure 3. Current Workflow for "Hours" Page



**Editable region template or libdata system**  
**Other/Autonomous – cream color**

Breakdown of possible transformed workflow technology implementation for 2nd level landing pages within "Hours" page.

Figure 4. Transformed Workflow for "Hours" Page