Texts of Our Institutional Lives: Accessibility Scans and Institutional Activity: An Activity Theory Analysis

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Introduction: Accessibility at the CWRL

Once a month, I log into a website with my University of Texas (UT) electronic ID and look at an exhaustive series of graphs and statistics about the collection of websites for the Computer Writing and Research Laboratory (CWRL). It's not a small job: the cwrl.utexas.edu domain currently has tens of thousands of pages, with more being added daily. My job is to review the newest statistics on these pages, ensure that they comply with the university's Web accessibility guidelines, and change the underlying code if they don't. These changes can sometimes be extensive, but they're all "under the hood": they don't involve changing the look of the site, just the way it interacts with adaptive technologies such as screen readers.

If you haven't heard about Web accessibility, chances are that you will soon. Loosely speaking, *Web accessibility* is the ability for any user to read and understand a website with appropriate adaptive technology. If a user is visually impaired, for instance, he or she should still be able to "read" the site by listening to a *screen reader*, a computer-generated voice that reads the page's text and provides appropriate feedback when the user makes changes. Users with impaired motor skills should still be able to navigate the site easily with just the keyboard, or just a pointing device. Similarly, hearing-impaired and cognitively impaired users should be accommodated. It is, as John Slatin and Sharron Rush point out, a civil rights issue: just as federal law requires curb cuts and ramps for wheelchairs, it requires accessible websites for en-

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tities that receive federal funding (*Maximum Accessibility*). And some recent lawsuits have made accessibility an issue even for those who do not receive such funding: the highest profile one is a recent lawsuit against Target, whose retail website violates accessibility guidelines with a vengeance.

But, of course, there is a problem: Web accessibility can't be defined simply by a set of regulations. It's defined in practice, in activity, or, rather, in several overlapping activities. And the tension or interference among these activities makes accessibility quite difficult to define.

Although we can identify several *structural violations* at websites (for instance, a series of unlabeled pictures would not be accessible to someone with a visual disability), most accessibility issues come to light through *interpretive checks*. A human being has to go through each warning and decide, for instance, whether a picture's label is appropriate and gives enough information to a visually disabled reader. (To get a sense of how this works out in practice, imagine your spell checker is so sensitive that it underlines every instance of "there," "their," and "they're" to force you to determine if you used the right one—and imagine that, if you misspell a word, someone won't be able to read your text properly.) With a website as large and rapidly developing as the CWRL's, these warnings come often; see Figure 1, an overview of accessibility violations on the cwrl.utexas.edu domain.

This combination of structural and interpretive checks means that someone who reviews accessibility must construct reasonable arguments about whether accessibility is met in a given instance—an argument that must hold reasonably in any number of overlapping activities. *Accessibility is a rhetorical enterprise*, one that must seek consensus across very different stakeholders. In the following discussion, I use activity theory to investigate accessibility as a contested, polymotivated object(ive) of overlapping activities.

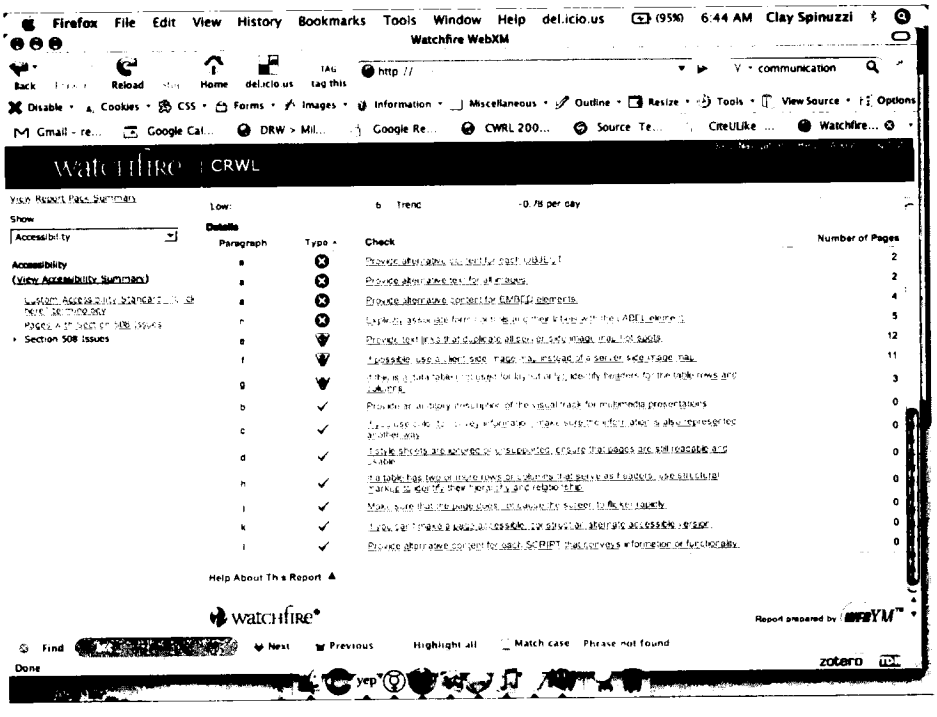
So let's review activity theory briefly, using my Web scans as an example, and then apply it to accessibility as a rhetorical practice.

Accessibility as an Object(ive)

To understand accessibility as a rhetorical enterprise, let's examine it in terms of activity theory (for primers on activity theory, see Kaptelinin and Nardi; Spinuzzi, *Tracing*.) In activity theory, activities are organized around an *object(ive)*—the object of our labor—that is repeatedly achieved and cyclically maintained (Russell). In this case, we achieve Web accessibility by examining Web scans, examining the pages with the particular issues, and changing the underlying code in those pages—and we do this every month. Since our website continually grows, we repeat this cycle month after month, achieving accessibility compliance repeatedly, but never permanently.

We achieve this object(ive) through various *instruments* that mediate, structure,

Figure 1. WebXM's* overview page, showing types of accessibility violations. *



and enable the activity, including the Web scans, but also Web development tools. Our efforts are grounded by several sets of *rules*, including accessibility standards, but also internal policies, solutions from accessibility texts, and tacit rules we have learned as Web designers. Those instruments and rules are mobilized in a *community* of people who collectively work on Web accessibility in the CWRL, a community with a set *division of labor* that assigns the actions that collectively constitute our accessibility efforts. And, finally, we have two desired *outcomes* to our accessibility efforts: we want to become regulatively compliant, meeting the University of Texas's accessibility guidelines, and we want to improve the *user experience* for those who utilize assistive technologies to enable their use of our website. (See Figure 2.)

So you have a snapshot of the constantly developing activity of ensuring Web accessibility at the CWRL. But we aren't the only ones involved in defining accessibility. Many other stakeholders are concerned, whose cyclical activities also involve the object(ive) of accessibility. But these stakeholders use different actors, instruments, communities, rules, and divisions of labor—and aim at different outcomes.

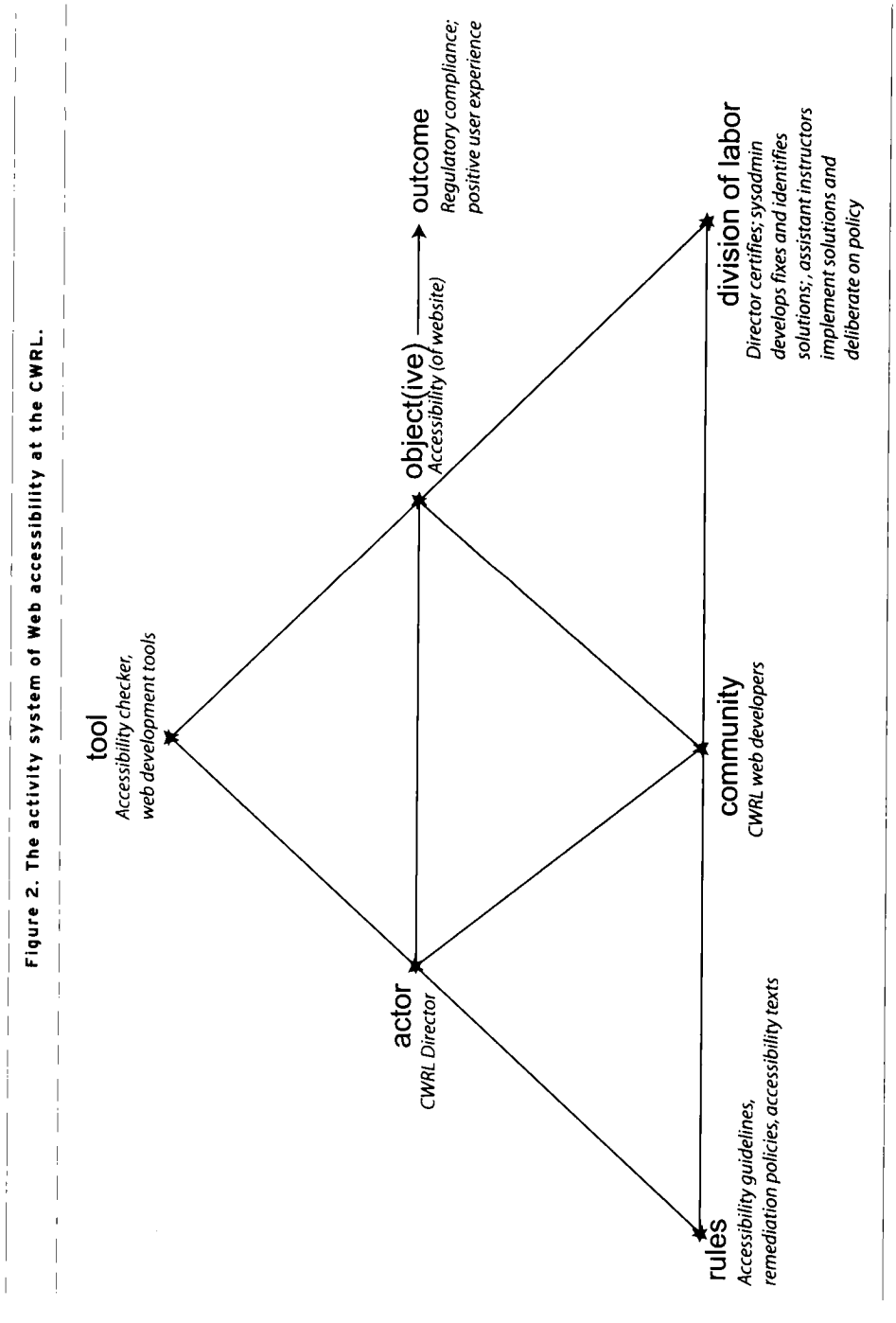


Figure 2. The activity system of Web accessibility at the CWRL.

Accessibility, that is, is a polymotivated object(ive); it is achieved as different activities intersect in order to meet radically different outcomes. Figure 3 shows such intersection. Contradictions among the activities continually destabilize the object(ive) of accessibility, leading to conflicting standards, criteria, and definitions. Thus, accessibility is a moving target, a result of continual negotiations within a *network* of activities (e.g., Blackler, Crump, and McDonald; Miettinen; Saarelma).

Consequently, as is often the case with an object(ive) at the intersection of multiple activities (see Spinuzzi, "Lost"), accessibility is a chimera: heavily interpreted, loosely defined, rapidly changing. So Web accessibility is mobilized (Latour; Spinuzzi, "Lost") in many, many different ways, and Figure 3 only hints at the many stakeholders and the many intersecting activities involved. Let's look at two competing senses of accessibility from an activity-theoretical standpoint as they play out in my institutional text.

ACCESSIBILITY AS AN OBJECT(IVE) OF REGULATIONS

One of our desired accessibility outcomes at the CWRL is *compliance*, something with which institutions are quite concerned. From the perspective of compliance, we need clear criteria or guidelines that could be automated when possible and delimited with simple judgments when not—criteria that can serve as a framework for agreement and validation and thus stabilize the activity. Many such sets of criteria are available, but at UT, we use Section 508 of the Rehabilitation Act, plus some institution-specific guidelines; these are collectively articulated as the UT Accessibility Guidelines. Such guidelines are both structural and interpretive.

Structural guidelines articulate checks that can be automated. For instance, when you include a graphic, you also have to label that graphic with "ALT text," a short textual description of the graphic. ALT text is usually invisible to sighted readers, but it provides a description that screen readers can read. Similarly, the guidelines deprecate several tags such as the FONT, I, and BOLD tags; if your page uses those tags to format your text's font or to include italics or boldface text, the guidelines steer you toward more appropriate ways to handle the formatting that are compliant with standards. These checks identify clear violations and are not considered arguable.

Interpretive guidelines, on the other hand, are arguable. For instance, the structural guidelines require ALT text to label each graphic, but no automated system can determine what ALT text is appropriate. If you're labeling a photo of computers, should the ALT text say "Computers" or "Macintosh computers in a CWRL classroom"—or, simply, "CWRL home"? Any of these choices are plausible, depending on authorial intent, and it would, in fact, be acceptable in some situations to leave the ALT text blank—forcing a screen reader to skip the graphic entirely, if it is

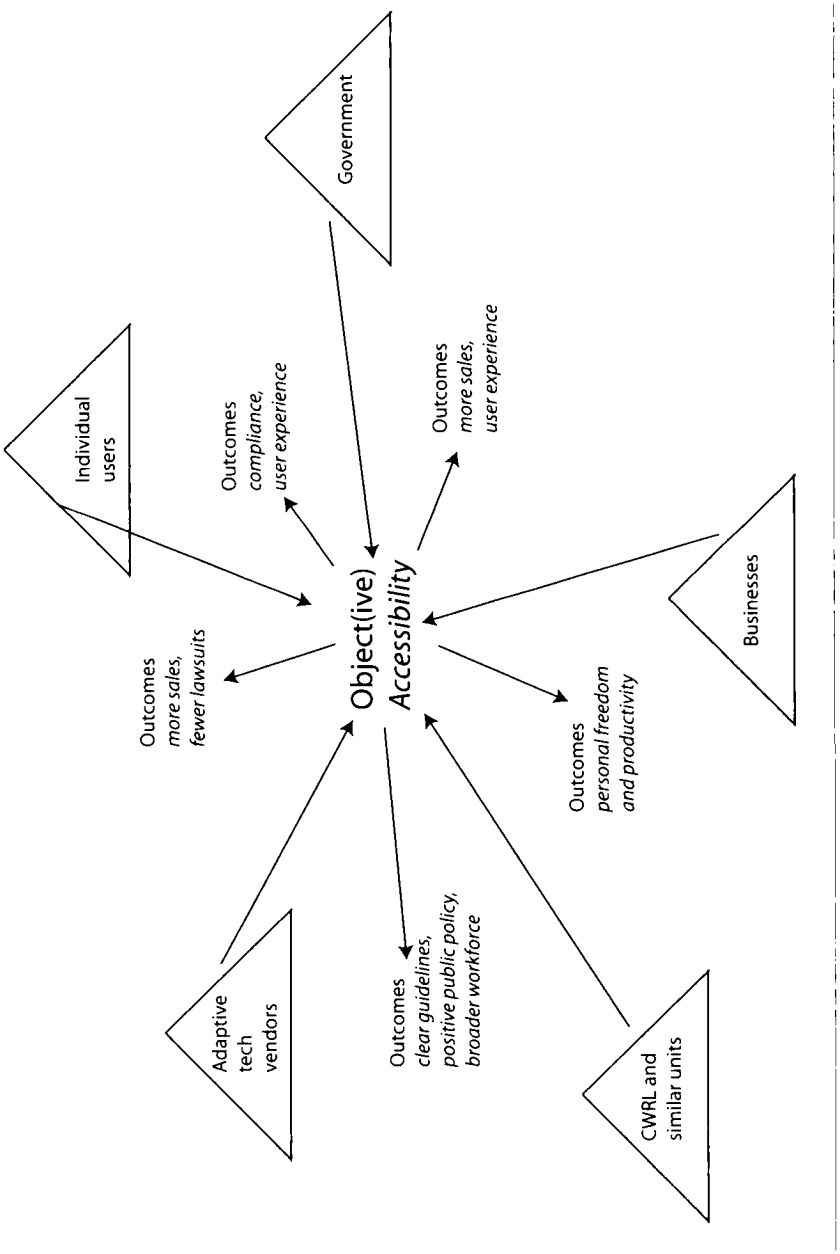


Figure 3. In this activity network, accessibility is a polymotivated object(ive) with radically different outcomes.

redundant with proximal textual information (e.g., if the graphic has a caption). Unlike structural checks, interpretive checks have room for argument; interpretive warnings are heuristics rather than about clear violations.

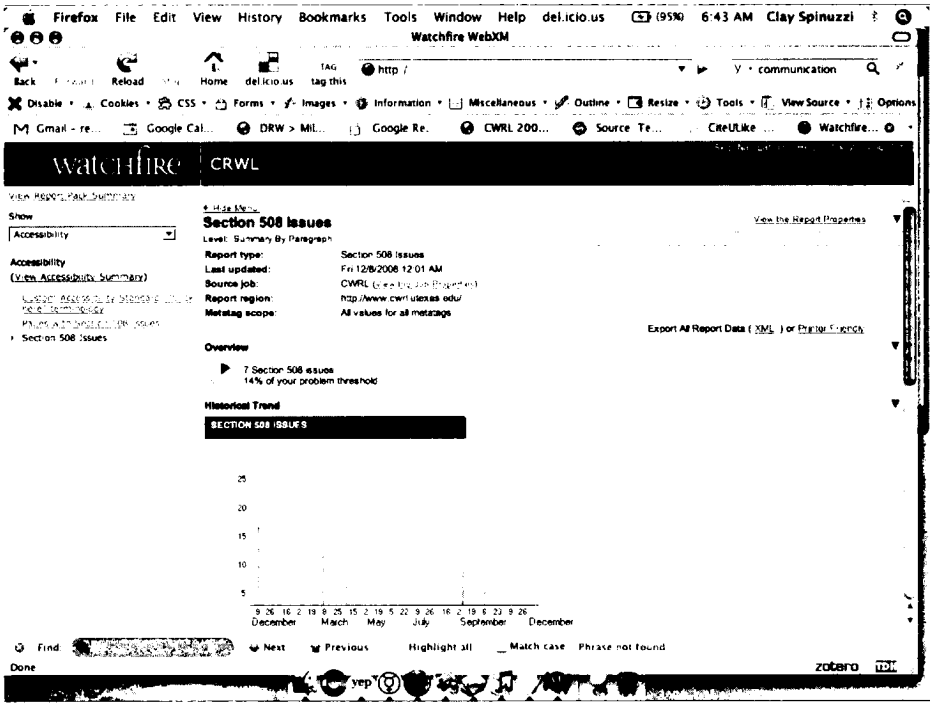
But even interpretive checks provide a framework for agreement and validation: they are rules that help stabilize the activity, rules that allow activities to work on the same object(ive). That's extremely important, because manufacturers of adaptive technology need standards so that the technology can interface with and reliably interpret the code. Without compliance, the array of adaptive technologies cannot translate text to speech for visually disabled users, for instance, or provide keyboard shortcuts for those with motor disabilities.

Standards compliance stabilizes the famously dynamic and often hacked construction of websites so that manufacturers of adaptive technology can interface with and interpret the code. Standards compliance, however, has been problematic in two ways. From the perspective of adaptive technology, these guidelines tend to be overly vague, overly specific, or difficult to understand (Brys and Vanderbauwhede; Bolchini, Colazzo, Paolini, and Vitali; Harper, Bechhofer, and Lunn). But from the perspective of Web development, compliance means limiting the site's visual design or finding more complex ways of rendering the same design. Few Web designers have been made aware of these guidelines or have developed the judgment to understand whether we are in compliance with them. The reality is quite the opposite: throughout the late 1990s and early 2000s, popular Web development texts, such as *Creating Killer Web Sites* (Siegal) and *Web Pages That Suck* (Flanders and Willis), focused on hacking and breaking standards so that designers could push the visual limits of websites, largely by dissociating the visual and semantic levels of the website's code. One example is the "one-pixel trick," in which the designer uses a one-pixel graphic to space elements. Visually, the graphic creates the illusion of proper, considered spacing as you might see on the printed page; the graphic itself gracefully disappears. But for visually impaired users with a screen reader, the one-pixel trick means that they hear the graphic's file name over and over again, confusingly, with no context and no good way to interpret it or skip it.

With that in mind, let's take a look at the text I read when I check accessibility on cwrl.utexas.edu. The accessibility checker I use, WebXM, presents a list of possible errors that have been detected in the most recent scan. At the top of the page is a histogram showing how many possible violations have been detected each month; notice the spike in early September that corresponds with a couple of new sites coming online on this domain (Figure 4).

Scrolling down lets us see a list of the various categories of Section 508 violations and how many possible violations were detected in each category (see Figure 1). The violations with Xs are structural violations: violations of definite rules, such as missing descriptions for graphics. You can see that we have only a few of these,

Figure 4. Histogram of accessibility issues.

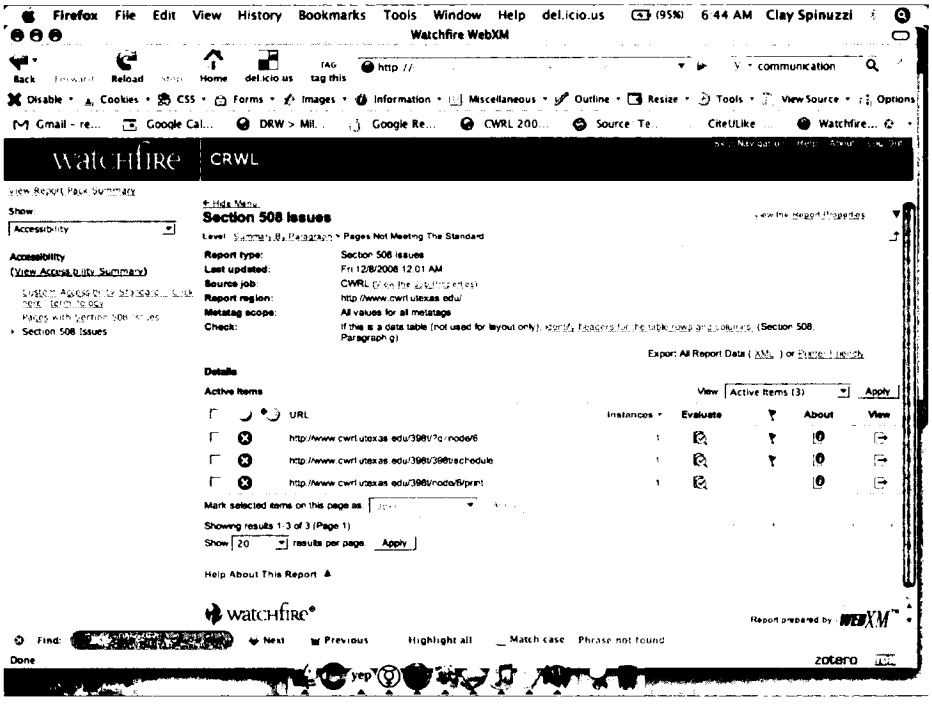


mostly on legacy pages that we have yet to remediate. The ones with exclamation points, on the other hand, are interpretive violations: ones that may or may not be problems. I have to check these out individually by looking at the actual HTML code in context. The ones with checkmarks are okay for now. With more pages coming online every day, I have to keep an eye on these.

Clicking on one of the violations brings up a list of the affected pages (Figure 5).

Here, we see that only three (new) pages have been affected by this violation. I can view these pages and alert my assistant directors to help remediate them. If they were interpretive violations, I could also review them and, when applicable, mark them as acceptable. In fact, with some interpretive checks, I mass-certify pages—something I can do with a clear conscience, because most pages on our domain run on a content-management system coded to avoid some of the most common structural and interpretive problems (see Brown, Hristova, Nelson, and Russell). In September, for instance, I certified about 3,500 new pages in this way. So my institutional

Figure 5. A list of pages affected by one structural violation.



text does an adequate job with compliance: I can quickly scan the entire domain, note violations and warnings, and assign specific problems to specific developers. But compliance is only one of my desired outcomes. The other is much harder to achieve.

ACCESSIBILITY AS AN OBJECT(IVE) OF USER EXPERIENCE

Accessibility is also achieved in lived experience, a much more important measure for those who actually have to use our websites. As Slatin argues, "accessibility is distributed": it is only realized in the user's activity, when the user tries to understand and navigate a given website ("Art of ALT"). Accessibility depends on the user's training and adaptive equipment as well as the website's characteristics. So whether the page is actually accessible or not depends on whether an individual with adaptive technology can actually use it, which cannot be measured with automated checkers or certified through an expert walkthrough, but, at best, can only be di-

rectly observed in individual cases. (See my related work on an ecological approach to usability in "Grappling.") Heuristics are heavily used in making these judgments (Slatin and Rush).

So there's a contradiction between accessibility as compliance and accessibility as user experience. This contradiction is exacerbated by the continual changes going on in the *information ecologies* that help constitute accessibility: the sets of texts and other information sources that collectively mediate an individual's or group's user experience (Nardi and O'Day; cf. Hutchins; Spinuzzi, *Tracing*; Syverson). Such ecologies include adaptive technologies, accessibility standards, the information to be made accessible, and the Web services that deliver that information. The tensions, drifts, and development within such information ecologies turn accessibility into a moving target. And Web designers, for the most part, cannot *control* these texts, just *anticipate* them. That is, if we examine accessibility as an object(ive) of user experience, we can only support probable configurations, not guarantee accessibility per se.

For instance, let's take adaptive technology. Screen reader software continues to be developed, and each version includes additional functionality. But because screen readers are so expensive, users are sometimes slow to upgrade. Consequently, a given page might be more accessible for a later version of a screen reader than an earlier one.

Similarly, Web accessibility standards continue to evolve. A page might be compliant with WCAG 1.0, for instance, but not WCAG 2.0. In terms of legislation, accessibility will probably continue to change, especially given pending lawsuits regarding website accessibility and the different standards adopted by different countries. In terms of information to be made accessible, new services and configurations are constantly coming online, and adaptive technology is not changing fast enough to keep up. These include services such as YouTube. Finally, various services are beginning to provide ways to make inaccessible websites accessible, both by design (Harper, Bechhofer, and Lunn) and as a product of "squeezing" pages for mobile technologies (e.g., www.skweezer.com).

As Slatin says, accessibility in this sense is "distributed" or ecological, and nowhere is that more evident than in these temporal drifts in tools and texts. These temporal drifts make it difficult to certify a website of any complexity as "accessible." Ensuring accessibility, that is, becomes a matter of probability rather than certainty, a matter of coordinating and negotiating among competing standards and outcomes rather than following a checklist. In short, accessibility becomes at least in part a *rhetorical* enterprise: The instruments for defining, detecting, diagnosing, enabling, and producing accessibility are mobilized in overlapping and contradictory activities.

Accessibility's Contradictions

So we have two contradictory understandings of accessibility: as a *prescription*, which can be certified through regulations and guidelines, and as a *description*, which emerges from user experience through an information ecology. Usually, these two understandings can be reconciled without much trouble, but sometimes they conflict, especially given the constantly changing technological environment.

Here's one recent example. Recently, CWRL students began embedding YouTube videos in the comments section of our site. These videos don't include captioning, so hearing-impaired users won't have the same experience as other users. Consequently, a page with a YouTube video would not be accessible from a *usability* standpoint for those users. But in a *legal and regulative* sense, we are not responsible for content hosted on someone else's site: as long as the tags (the bits of code that cause the video to appear on our page) are properly coded, we don't bear responsibility for the content that is pulled in via that tag; it is not part of our page per se. Here, the object(ive) of Web accessibility becomes ruptured: we both do and do not achieve Web accessibility. This disruption indicates the contradiction in the object(ive), and that contradiction, that crisis, is currently driving us to deliberate over our own internal policies in order to address users' experiences as well as regulations.

Disruptions such as these must be addressed, of course. The contradiction is not going away anytime soon, but we can find ways to mitigate the disruptions it engenders. And those ways are largely rhetorical. We deliberate over policy, we evaluate possible solutions and past actions, and we negotiate solutions that balance the needs of each outcome in order to hold together the shared object(ive) of accessibility.

Conclusion

So what does it mean that accessibility is—at least, in part—a rhetorical enterprise? That these contradictions must be negotiated? In one sense, not much. Even though bureaucratic texts often appear to be arbitrary and rigid (and, yes, in many cases, they are implemented in this way), they are meant to embody, enliven, and facilitate policy objectives such as accessibility: policy objectives that lie at the nexus of several different vital activities, objectives that bureaucratic texts are meant to reconcile. From the perspective of a college webmaster or lab director, a bureaucratic text appears to be another checklist to tick off, another obstacle to overcome, another bloodless set of rules with little relevance. But trace these "lifeless" texts back to their originating activities and you can often find lively discussions of policy, deliberations in which you can participate directly and through your implementation of that policy.

As I review those monthly scans and the HTML that they've flagged, I recognize that this work—as much as it might seem like bureaucratic paperwork—is part of an interdisciplinary effort to define and refine accessibility in multiple activities, to resolve its contradictions, and to turn it into a (more) settled enterprise that concretely improves people's lives. The job is tedious. But it's also a worthwhile job for a rhetorician.

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