# Discussion

This series of research papers has two main aims. One is to present a longitudinal quantitative analysis of the state of web accessibility in our sample set of academic libraries. The other is to explore possible links between design methods and quantitative measures of accessibility.

## Trends in Library Website Accessibility

With a decade's worth of data in four data sets over this timespan, it is now possible to draw some broad conclusions about trends in web accessibility. As the information discussed in the Results section indicates, there has been improvement in the quantitative accessibility metrics employed in this series of studies. In particular, the average number of barriers per page has fallen dramatically. From an average of nearly five errors per page down to just 1.66 is a significant step forward.

Unfortunately, the average percentage of errors per site has apparently plateaued at around 60 per cent. While considerably better than the 40 per cent found in studies done at the turn of 21st century, still two out of five library site pages are plagued with Priority 1 errors.

To try to reach a better understanding of these numbers, the authors have endeavored to look for correlations between website design methods and website accessibility. The factors we have considered are methods of page layout; usage of a content management system, and the presence of a tabbed search interface on the library's home page.

## Table vs. CSS-based Layout

The method of page layout refers to whether the layout of a website is based on tables or CSS. As discussed in Comeaux and Schmetzke (2007), HTML tables had been used for many years by web designers to create website layouts – to place menus, content, and features in certain areas of the page. However, tables were intended to be used to display tabular data, not as a layout mechanism. So designers often resorted to using what are commonly referred to as "spacer" images placed in table cells to help achieve the desired appearance. As Comeaux and Schmetzke noted, it appeared that many of the missing alt tags were tied to spacer images. It was then suggested that future research should be done to see if a correlation exists between use of tables for layout and poor accessibility measurements because of this problem.

In this study, this specific research questions was addressed. As mentioned in the results section, the sites which use tables for layout have a higher number of errors per page. However, because of the small sample size (12), it is susceptible to extremes. For example, one site (North Carolina Central) has an extremely high number of errors per page (19.74). Removing this site from the sample brings the average down to 1.04, which is less than the CSS-based group. Also, two of the table-based sites (UCLA and University of Washington) have perfect accessibility metrics in this study. This indicates that sites can still be designed with table-based layouts and meet basic accessibility standards.

What is the difference? One clear difference between the University of Washington's site and North Carolina Central's site is the complexity of the table layout. As you can see in Appendix (n), Washington's home page has a relatively simple table layout using only five table cells. NCCU on the other hand, has an extremely complex arrangement of tables nested within tables. It may be reasonable to assume that the more tables are used, the higher the likelihood that spacer images will be required. It also seems likely that nesting of tables exacerbates the need for spacer images.

Use of Content Management Systems

Another design decision with major potential implications for accessibility is whether to build your website with a content management system (CMS). As discussed earlier in this paper, a CMS may help accessibility by providing for a consistent template structure underlying a site's visible page layout. A CMS could potentially lessen accessibility by enabling staff with little training or knowledge of accessibility to produce web content which does not follow accessibility best practices. As the use of CMS is becoming increasingly common in academic libraries, we believe an analysis will be helpful to the profession.

As noted in the results section, the use of a CMS is strongly associated with higher accessibility metrics. The sites identified as using a CMS had a much higher average of approved pages (72.69% compared to 55.71%) and a much lower average of errors per of page (1.12 compared to 1.93). Clearly the accessibility advantages outweigh the possible negatives.