

Incorporating Universal Design into Usability Efforts at MIT

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Background

Over the past few years Massachusetts Institute of Technology (MIT) has, like other universities, transitioned many of its academic and administrative functions from paper to the World Wide Web. Some examples of these electronic functions include class registration, course web sites, online quizzes, events calendars, online databases, personnel administration and computer purchasing. Since much of this information is critical and is no longer presented in other formats, issues of accessibility to users with disabilities have invariably arisen.

Legal Issues

As a university receiving federal funds, MIT is subject to Section 504 of the Rehabilitation Act of 1973, which requires such institutions to make their programs accessible to people with disabilities as well as to provide “effective communication” to those with reading or hearing disabilities. MIT is also subject to the Americans with Disabilities Act (ADA), which requires that MIT provide accessibility in its facilities and programs, as well as reasonable accommodations to its employees.

Recent complaints filed with the US Department of Justice by students with disabilities at various universities have called attention to the lack of accessibility of online documents, web pages, software, and library resources. It behooves all of us who work in information technology to ensure that our resources are available to users with disabilities.

Developing an Accessibility Policy

In 1999 the authors gathered together a team of representatives from offices across campus to examine what we could do to insure that information placed on the Web at MIT is accessible and to develop a policy and guidelines to help the MIT community comply with federal accessibility laws. We were advised by Salome Heyward, an attorney who specializes in accessibility issues related to higher education. The team met over a period of several months while we drafted the policy and worked out a plan to inform the community. In trying to come up with an approach for dealing with this issue, we found that looking at it from a Universal Design perspective made the most sense. Our advice to Web developers has always been that with a bit of care it is possible to create Web pages that are accessible to users with the widest range of abilities and it is usually not necessary to create text-only versions of sites.

The outcome of our work was a Web accessibility policy and guidelines based on the World Wide Web Consortium’s Web Accessibility Initiative’s (WAI) guidelines. The most important aspect of our work, however, was getting the word out. We found that most people who were developing Web pages were unaware of accessibility issues and so a large part of our effort has been toward outreach and education. We sent out a mass mailing postcard with the policy and a link to our Web page with the guidelines. We wrote articles for several MIT newsletters and newspapers, had the issue as a “spotlight” on MIT’s home page, and conduct monthly lunch hour *Quick Start* classes titled “Web Accessibility and Universal Design”.

Toward a More Unified Policy

After developing MIT's Web Accessibility Policy and Principles (located at <http://web.mit.edu/ada/waccess.html>), we realized that just requiring accessibility of Web pages was insufficient. Although many software applications are being written in Java with Web user interfaces, there are still many software packages being purchased for campus use that have standard GUI interfaces. These packages have their own accessibility issues and we found that it was necessary to educate the MIT community about them so that they could make informed decisions when commissioning new software or purchasing third party software for use at MIT. We have developed an Information Technology Accessibility Policy that states the following:

MIT is committed to providing equal access to information technology in accordance with Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act. This commitment ensures that MIT Web pages, software, online documentation, and library resources will be accessible to users with disabilities.

- Web pages associated with administration and services, courses of instruction, departmental programs, and Institute sponsored activities, must adhere to Web accessibility principles.
- Software that is purchased, licensed, or developed for general Institute use needs to be reviewed for accessibility features listed in the Software Accessibility checklist.

The IT Accessibility Policy is currently in draft format (as of January 2001), but should be finalized during the spring of 2001. The new team convened to discuss software accessibility included programmers who helped us make sense of the developers guidelines. In developing the guidelines (based on IBM's Software Accessibility Guidelines), we formulated a separate purchaser checklist with simpler language for those who purchase software for their departments. The original software accessibility guidelines were intended for programmers and we were concerned that purchasers would not understand what to look for (<http://web.mit.edu/is/integration/projects/softaccessibility/>). We also have a separate list of guidelines for programmers together with links to examples, both graphical and textual.

One of our suggestions for new software programmers will be to use Java as their programming language if possible. Besides the obvious advantage of platform independence that comes with using Java, the Java Swing Set includes built-in accessibility features that make it very easy to insure that the user interface is accessible to adaptive technologies.

We are trying to think of other ways to make it easy for people to check for accessibility of software. One possibility is to offer a software review service so that people can come to us to review software packages they are considering for purchase. We could test using adaptive technologies in the ATIC lab, including screen reading, magnification and voice recognition.

Education

Once again, the new policy and guidelines would be useless without people being made aware of their existence through publicity and education. Since the audience for software purchasers and programmers is more concentrated, our plans to publicize the software accessibility guidelines include meeting with administrators and programmers in each department, as well as review the guidelines with the Academic Council, a group of faculty that review policies, and our purchasing department. We will also conduct the same blitz of newsletter articles to publicize the new policy and guidelines. The most important tool we have is communication. We have discovered

that most staff at MIT are willing to comply with the guidelines once they are made aware of accessibility problems with various technologies.

Incorporating Accessibility Into Usability – The MIT Usability Team

After MIT released the Web Accessibility Policy and Guidelines in the fall of 1999, we became aware that there were many development projects going on at MIT that we didn't know about. We would find out about new releases of software or web sites, look at them after their release and realize there were accessibility problems. Unfortunately it was usually too late to do anything about it.

Eventually our interest in accessibility led us to becoming members of the newly formed MIT Usability Team. To our thinking accessibility was just a sub-set of usability. Therefore, we naturally included users with disabilities when identifying representative users for testing. Testers with disabilities so far have been recruited from the student population using the Adaptive Technology Lab. We hope to extend our recruitment to include staff and students using varying kinds of adaptive technologies or accessibility features resident in operating systems.

The MIT Usability Team is made up of members from different groups and departments on campus and works to foster an understanding of usability practices and theories that can be applied to ongoing development at MIT. We act as consultants to internal project teams that are developing applications or Web sites, perform heuristic evaluations, plan and conduct usability tests, and advise programmers in their work. The team, which started out as a "special interest group" for anyone to join, has evolved into a standing team with a budget and our own testing lab. Interest in our work is rapidly growing and over the past few months we have been sought out by many different groups around the campus to test the usability of software under development and even grant funded research projects. We do not need to go out to solicit work. People seek us out.

The Usability Team (<http://web.mit.edu/is/usability>) meets weekly to discuss ongoing projects and also meets with project teams or programmers to discuss how the Team might assist them in their work. Some project team members have very specific ideas about what they want and others aren't sure what we do. A large part of the Usability Team's work is to educate IT professionals about usability. Many assume that we are Quality Assurance testers or beta testers, which resulted in our being sought too late for any feedback to be incorporated into the release of the product. We are working to make sure usability is included early on in the process. This also aids in our accessibility efforts, so that we can spot accessibility problems before significant development has already been done.

The Adaptive Technology Lab has hired a part-time consultant who does testing of software and Web pages that are being evaluated for usability. He is a seasoned screen reader user and former programmer whose input is crucial to accessibility reviews. We are including him, and other customers of the Adaptive Computing Lab in our efforts to have users of adaptive technologies perform usability tests of the particular products the team is evaluating. We are planning possible usability tests of some adaptive technologies, such as screen readers and voice recognition software.

The Challenge of Including Accessibility in Usability Testing

Last year MIT was the recipient of several large grants for research in developing educational technology. MIT's Academic Computing group has been talking to the principal investigators of these projects and informing them of the existence of the Usability Team and how the team's

work can help them create better products from their research. Many of these projects include graphical Java-based tools and graphical simulations. The challenge is how to encourage these programmers to consider the wide range of users who will be using tools that are essentially visual learning aids. In some cases there is no solution other than to point them to guidelines such as the newly released WGBH National Center for Accessible Media (NCAM) Educational Software Guidelines and request that they at least include descriptive information in non-graphical formats.

One project we are involved with which is being developed by MIT in conjunction with a number of other colleges and universities is called the Open Courseware Initiative. This project is funded by a Mellon grant and the objective is to design a modular online learning system that is open source so that schools can take desired components and easily fit them into their own campus infrastructure. This system will enable instructional staff to easily create and manage online class materials as well as offer communication tools such as discussion boards, chats, online testing, online grade books and much more. This project will require a substantial usability effort. Components of the design will require testing by instructional staff, students and administrators. The challenge for the Usability engineers will be to find testers who represent the wide range of users including those with disabilities. Since some of the components are being developed at other sites, usability efforts will need to be coordinated.

Since MIT has a small population of users with disabilities (approximately 125 out of a student and staff population of 18,000), we might consider recruitment of users outside MIT to fully explore the user experience among a variety of users with disabilities.

Conclusion

Futurists predict that eventually we will leave this crude graphical phase of information technology and will eventually interact with our technology in a more human ways such as with speech, but until this happens we usability professionals will have plenty of work. Besides including the full range of potential users in usability testing, we should act as advocates for accessibility. Educating programmers about their audience while they are designing applications will help make our work easier, too.