Chapter 7: TEST THE COMPUTER PROTOTYPE

Remember: Authentic Subjects, Authentic Tasks, and Authentic Conditions

Unless you have altered the goals for your site since you tested the paper prototype, you are likely to be using the same audience profiles and tasks for the computer prototype. You'll be looking for new subjects so that they haven't already "learned your design," but their profiles will be similar to those of the previous subjects.

Be careful to give subjects only the type and amount of support that they would have if they visited your site. If you expect to publish a "Getting started ..." pamphlet to your departmental audience, mock one up for your test sessions and give it to your subjects. If you expect to have a telephone support line, simulate it by placing a phone next to your subjects and giving them a number to dial if they feel they need assistance. Position a volunteer on the other end of the line with a "cheat sheet" like the one you will probably give your support line personnel.

For these rounds of testing you will also have to consider the different computer platforms and browsers that your audience may be using after the site is published to the Web. Unless you are absolutely sure that your audience uses only one particular browser on one particular platform, be sure to test your computer prototype on as many platforms and browsers as you can.

Don't forget to conduct some tests on a keyboard-based, text-only browser like Lynx. Lynx is a copyrighted browser from the distributed computing group of the University of Kansas. It is free for instructional and research educational use and is widely used by people who want fast access to the Web or who do not have graphical computing capabilities. Lynx users do not see the graphics on your pages, and they have to press arrow keys, or their equivalents, to move from link to link on a page. Although you may not be designing your pages for an audience made up entirely of Lynx users, you want to be sure that these users can navigate your pages without too much trouble.

Make a Test Plan

If you created a couple test plans while you were testing your paper prototype, you can revise the latest one for testing the computer prototype. The plan should include:

- a description of the prototype
- profiles of the subjects for the test
- a list of the computer platforms and browsers to be used for the tests
- the number of subjects/test sessions
- description of the test sessions
- tasks the subjects will be asked to complete
- a script for team members to use with the subjects
Description of the Prototype

Print out the pages of your computer prototype from the Web and include them in the test plan. You will be glad you have them later when your archived copy is accidentally erased from the last disk where someone had it stored and you are trying to reconstruct the sequence of decisions that led to your current design. You may also find that a few stakeholders refer to this paper copy instead of looking at the site on the computer, especially when the prototype is not published to the Web where it is easily accessible.

Profiles of the Subjects for the Test

Continue to test subjects from as many profiles as you can within your target audience. Adjust the percentages to match what you know or suspect about your audience; if "most of them" are engineers from your own organization, 6 or 7 out of 8 subjects should be engineers from your organization. When you can't find subjects from every profile, concentrate on those who may have the most difficulties; people with low levels of Web or computer experience, people who least familiar with your content, and people who will not be able to give you feedback easily once the site is published.

Computer Platforms and Browsers to Be Used for the Tests

List the platform/browser combinations you hope to use for testing. If you are designing a limited-access site that will be used only by people in your organization, and you know what platforms and browsers are used by everyone in your organization, you can test only with those. Consider, however, the possibility that portions of your site may be opened to other audiences at a later time before you make the decision to limit your testing.

If you are designing for wide audience, or an audience whose hardware and software configurations are not known, choose browser/platform combinations that exhibit a range of different characteristics so that you can be reasonably confident that your site will be usable by your audience.

Number of Subjects/test Sessions

A series of test sessions conducted using one prototype constitutes a "round" of testing. If you choose subjects who are representative of the target profiles you can conduct a minimum of 8-10 sessions in a round, one subject per session, and achieve useful results. This number of subjects will never prove that your design is problem-free, but it will certainly show where your design needs improvement.

Description of the Test Sessions

Write a brief description of how the test sessions will be conducted. Indicate what the team members will do and what the subjects will be expected to do. Modify this section of the plan to
account for the fact that you are using the computer. Keep the
description simple; it will be helpful for educating those outside the
team about the process you are using to design the site.

Tasks the Subjects Will Be Asked to Complete

List the tasks that you will ask subjects to complete during the test
sessions. Use the same tasks that you used to test the paper prototype
since those tasks are representative of your users' most common needs.
You may find that subjects with low levels of computer or Web
experience take longer to complete the same number of tasks on the
computer than similar subjects did using your paper prototype because
they spend time getting used to the basic navigation conventions of the
Web. Keep the sessions about the same length you did before even if
subjects complete fewer tasks. Your sessions will not be very
productive after an hour and a half or so because it is tiring for them to
be observed while they work, to think out loud, and to be asked
questions about what they're doing. Many usability tests do take longer
than 90 minutes (often with breaks scheduled in or divided over several
days), but for this kind of testing we have gotten useful results with
short sessions.

The tasks that you used for testing the paper prototype ought to
take your subjects through the key portions of your prototype, and
represent the most frequently needs you discovered when you analyzed
your audience early in the process. If you have more tasks than you
estimate that one subject can complete, divide them up and let different
team members present these tasks to different subjects. Be sure to
overlap a large portion of the tasks so that you can compare
performance between subjects, and be sure to give some similar tasks to
subjects of all different profiles.

Script for Team Members to Use with the Subjects

Create a short script that team members will use to introduce the
prototype to subjects and to guide any standard follow-up questions the
team has decided to ask. You can modify the script you used for the
paper prototype tests, and you may find that the team members have
good suggestions for modifications as a result of using the previous
one.

Remember that it's not essential to say precisely the same thing to
each subject, but it is important that team members be consistent in
explaining to subjects how the sessions will be conducted. Even
experienced testers find scripts helpful to keep them from forgetting
some of what they should say.

[SIDEBAR: precautions for working with subjects]

Prepare the Computer Equipment You Will Need

Depending on what is available in your organization you may have
to spend some time locating computers and software to conduct you
tests. Fortunately, you can take your subject and your observation
sheets to a location where you have permission to use a computer, instead of trying to drag a bunch of equipment all to one place.

**Coordinate Observers**

The team members who tested the paper prototype are good candidates to be observers for testing the computer prototype because they have some experience conducting test sessions. Get everyone who will be observers for these sessions together, and if some of them have not conducted sessions before, encourage the "veterans" to share their experiences as you review the checklist of what to do, what to say, and what to look for.

**What to Do**

- Observe. Watch and listen carefully. Take down notes in the subjects' own words.
- Put the subjects at ease. Don't rush them or crowd them. Be calm and encouraging.

**What to Say**

- Turn questions back to the subjects. Say, "What do you think you should do now?" or "What did you expect to see?"
- Prompt subjects who are not thinking out loud. Instead of assuming that you know what they’re thinking, ask, "Can you tell me what you're thinking now?"
- Probe for more information when you get vague or incomplete statements from subjects. Ask, "What made you choose that link?" instead of "Why did you choose that link?" so that subjects don't feel defensive about explaining their actions.

**What to Look For**

- Subjects getting stuck and giving up -- this is the easiest one.
- Subjects doing things you didn't expect them to do. Pay attention to why they make the wrong choices.
- Subjects not doing things that you expected them to. Try to notice the things they avoid or overlook.
- Subjects making self-deprecating remarks. Many subjects blame themselves when they are uncertain about what to do. When you hear, "Oh, I should have seen that," it's your cue that there is a problem in the design.
- Subjects doing things right but with trepidation. The design is not supporting these subjects well enough for them to feel comfortable; capture this in your notes.
- Subjects doing things wrong but with confidence. Probe for the reasons behind their choices.

Ensure that all the observers know how to operate the computers and the browsers they will be using for their test sessions. It's easy to assume that "the Web is the Web," and then find yourself struggling.
with an unfamiliar operating system or browser interface while your subject sits there losing confidence in you and the process.

**Identify and Recruit Subjects**

Find people who match the profiles of your target audience and who are willing to participate in test sessions. Get actual members of the target audience whenever you can. Look within your organization, within the network of people who may be known by team members, and within other organizations where people fit the profiles you need. If you can't get actual members of the target audience, look for people whose characteristics most nearly match those of the profile.

Decide whether or not you will have to compensate subjects. Often you will not need to offer compensation because people are curious about the process, or just want to help out with the project. If you do pay subjects, be sure to give each one the same amount. A payment of $5 - $15, or a token gift expresses your appreciation for the subjects' time. If you are recruiting professional workers from outside your organization to participate in sessions during business hours, you may need to offer compensation closer to an average rate of pay for their line of work.

Since you are testing on the computer this time, pay special attention to the computer experience portions of your target profiles when you identify subjects. We have found that simply asking people to identify themselves as "novice" or "experienced" or "expert" computer users is not an accurate way to tell how much experience they have. People's estimation of their own expertise is influenced by many factors and we often find during testing that their estimations do not match our own. Ask people how much time they spend using a computer, or the Web, every day. Ask them how many different computer programs they use on a regular basis, and ask them a few specific technical questions about common computing terms or concepts. The combination of their answers will give you enough information to rate their experience fairly accurately. If you ask these questions at the time you are recruiting subjects, you can accept or eliminate them depending on whether or not you have enough people who match their profile already.

**Conduct the Sessions**

Our illustration of a "typical" test session for a computer prototype is similar to the one we give for a paper prototype, and your sessions will be similar to those you conducted before. You may find that you have to watch the computer screen closely in order to catch the subjects' actions. You may also have to help a few subjects with the basics of computer interface. If you do, note their problems on your observation sheets; you probably can't fix these problems, but it's important to be aware of what problems might face the novice users in your target population.
Welcome

Greet subjects and explain that this observation is one of several that will be conducted as part of the design process, that your design isn't finished, and that any trouble they have using the prototype will be the fault of the design. Tell them what's going to happen during the session; people are less anxious in any situation when they know ahead of time what will be happening. Ask if they're ready to begin, and answer any questions they have about the session.

[SIDEBAR: safeguards for subjects (repeat)]

Present the Prototype

You should have the main page of your site visible on screen when the session begins. Explain that the prototype is not complete (since it is on the computer people are more likely to expect that everything is there than they were when you used a paper prototype). For novice Web users demonstrate the use of a link if necessary, but don't get involved in explaining how the site works or you will defeat the purpose of the test session.
Start the usability test at the first Web page of the site

**Describe Thinking Aloud**

Tell the subjects that you need to know what they're thinking as they work, and ask them to think aloud as they go along. Remind them to read aloud whatever they read from the computer screen. Assure them that you know there are problems with the design, so they should not feel uncomfortable if the thoughts they are verbalizing are confused or negative.
Present Tasks

Present tasks to the subjects one at a time so the whole list doesn't look overwhelming. Sit back and let them start. Remember to prompt and probe as necessary, and respond to subjects' questions by turning the questions back to them. If subjects run into errors with the prototype or technical problems with the browser, help them only enough to get them back on track with the task.

Observe and Record Data

Fill out your observation sheets as the subjects work. Capture their choices and their comments along with any non-verbal data you feel is important. When they finish a task, present another one. If they give up on a task probe for the source of confusion as necessary, then thank them and move on to another one.
Wrap Up

When the tasks are done or your time is up, ask any follow-up questions you have planned, or any that have arisen during the session. Give the subjects time to ask questions of their own. If they haven't been able to complete a task, they often want to be shown what the "right" answer was, and there is no harm in showing them now that the session has ended. Thank the subjects for their help.
Deborah, during this session you stopped a couple times and had a little trouble getting back. Can you tell me what was going on then?

Well, I don't use the Web too much so I'm not too familiar with it. I don't have too much computer experience.

That's why we conduct these sessions -- we're trying to make it easier for people without much experience. Did you see anything on the screen to help you at those times?

Only that little square that says "Back." It seemed to work once I figured it out.

Thank you. Do you have any questions?

No, I don't think so.

Ok. Thanks again, Deborah. You've been very helpful.

[SIDEBAR: keeping a good reputation for your design team among potential subjects; ensuring that subjects may agree to help you again]
Analyze the Results

Your team will probably find it easier to analyze the test results each time you conduct a round of tests. The analysis phase consists of several activities, and the more practice you have the more these activities will mesh easily with one another. Resist the temptation to skip over steps in the process and rush into diagnosis of problems; use a checklist to be sure you have assembled your data and examined it before you identify your problems, diagnose the causes of them and create a prioritized list of revisions.

Get Your Hands on the Data

- Assemble all the observers from this round of test sessions. Hold this meeting as soon as possible after the last session ends.
- Have each observer report on her sessions using the observations sheets on which she has highlighted significant items. Describe subjects, how they fit the profiles, length and location of sessions, and what happened with each subject.
As a team, create a master list of significant observations, and capture the frequency with which various problems were observed.

Look for Patterns That Indicate Problems

- Identify patterns. These will often be apparent because of the frequency with which certain mistakes or behaviors are reported. Study the master list to see if there are any "non-behavior" patterns revealed; "No one chose the link for Knowledge Base."
- Describe problems. You will probably convert the observation list into a list of problems, joining items or explicating them as you need to.

Diagnose the Causes of the Problems

- Go back to the observation sheets and study the comments and records of paths taken by subjects for clues to the causes of problems.
Create a list of findings. Describe problems with the prototype design, not problems with the subjects.

Create a Prioritized List of Revisions to Apply to the Prototype

- Look at all the known problems together.
- Discuss revisions that might fix the problems, and explore how those revisions will affect the overall design or even cause new problems.
- Decide on the revisions to be made.
- Prioritize the list by ranking revisions according to the amount of trouble the original problems will cause for users, the ease with which users can recover from those problems when they're encountered, and the negative effect the problems are likely to have on the users' experience with your Web site.
Computer Prototyping: What Do I Do Next?

Report the Results of Your Test Sessions

Report the results of your test sessions to your stakeholders. Do not report that your prototype has been “verified as usable,” because it hasn’t. Report that you have found problems in the design now instead of later, after the site is published. If you have followed general guidelines for good design in creating your prototype, you can report these results with confidence because the problems you have found are unique to the combination of users, tasks, and conditions for this site — unknowable until you tried them out.

[SIDEBAR: Using reporting to predict problems when testing is cut short]
MovingAheadwiththePrototype

What you do next depends on what happened with your last prototype. If you didn't discover any new major problems in the last round of testing, and you found that major problems from before seem to have been corrected, then you're ready to move the prototype to the computer. If there are still "priority one" problems in the prototype, revise it and test it again.

GetReviewsfromStakeholdersBeforeYouGoOn

Make the prototype available and invite stakeholders to review it. Let them know that this is the design you expect to publish. Be sure that your usability test reports and your revised style guide are available and be sure to explain again the process you have been using to create this design. Most stakeholders sincerely want the site to be useful and usable for your target audience, so they will be likely to accept the design when they know you have tested it -- even if parts of it do not appeal to them personally.

[SIDEBAR: avoiding last minute coups]