Chapter 6.1 showed how you can uncover a person’s initial mental model formed when he or she sees your sketched system for the first time. Yet that technique does not reveal how that person’s view of your system unfolds as he or she actually tries to use it.

**Passive observation** is one simple but not particularly effective method. The idea is that you introduce the sketched system to a person, and then you observe how that person uses it. Observation lets you see the person’s physical acts. From these, you can perhaps infer what is going on. Hesitations suggest difficulties. Successful quick actions suggest no problems. Incorrect actions suggest mis-understanding and errors. However, your inferences will be superficial, as you will never really know what is going on in a person’s head.

This is where the **think aloud method** helps. As briefly introduced in Chapter 6.2, the approach is to have people think aloud, where they say what they are thinking as they use your sketch to do a task. This method is easy to learn, cheap, simple and fast to do. Yet it can reveal a significant amount of information, especially usability problems. As Gomoll and Nicol [1990] explain,

> “by listening to participants think and plan, you can examine their expectations for your product, as well as their intentions and their problem solving strategies.”

Catching and repairing usability and conceptual problems during the early design phase can lead to significant savings in the development process. These and other reasons explain why think aloud is the most frequently used evaluation method employed by professional user experience designers and usability engineers.

**STEPS OF THINK ALOUD**

There are many books that describe the think-aloud method and its variations. Some go into great detail, as in Dumais and Redish's *Practical Guide to Usability Testing*. Books like these should be required reading if you are taking usability testing seriously, as they go into excellent detail about how to set up studies, how to define tasks, how to prepare for the test, ethics in running a test, and so on.

However, a few simple steps can get you going right away. Perhaps the shortest and best summary of think aloud was produced by Gomoll and Nicol in their 1999 paper: *User Observation: Guidelines for Apple Developers*. This chapter reproduces liberally from these guidelines, albeit (with apologies to them) in a somewhat pictorial, modified and summarized form.
1 Preparation

a. **Set an objective.** Take time to figure out what you’re testing and what you’re not. In other words, determine an objective that focuses on a specific aspect of the product. By limiting the scope of the test, you’re more likely to get information that helps you solve a specific problem.

b. **Design the tasks.** You should give your participant one or more specific tasks to do. These tasks should be real tasks that you expect most users will do when they use your product. After you determine which tasks to use, write them out as short, simple instructions.

c. **Prepare your sketch so that people can interact with it.** If you want to explore how people do particular tasks, make sure that the expected interaction sequences are available (e.g., as in a scripted slide show, described in Chapter 4.1). When a person does an action, you can then manually switch the sketch to the next scene. Alternately, use a branching storyboard (Chapter 4.3) to have the system give the illusion that it is actually responding to them. Or you can reveal system responses via Wizard of Oz (Chapter 6.2). Your sketch doesn’t need to cover everything; your on-going instructions can limit the scope of what your test user should be trying to do.

d. **Prepare equipment.** If you are audio or video-recording the session, make sure it’s set up ahead of time and working well.
**A. Introduce yourself, and describe the purpose of the observation (in general terms).** Set the participant at ease by stressing that you're trying to find problems in the product. For example:

Hi, I'm Joe. You're helping us by trying out this product in its early stages. We're looking for places where the product may be difficult to use. If you have trouble with some of the tasks, it's the product's fault, not yours. Don't feel bad; that's exactly what we're looking for. If we can locate the trouble spots, then we can go back and improve the product. Remember, we're testing the product, not you.

**B. Tell the participant that it's okay to quit at any time.** Participants shouldn't feel like they're locked into completing tasks.

Although I don't know of any reason for this to happen, if you should become uncomfortable or find this test objectionable in any way, you are free to quit at any time.

**C. Talk about the equipment in the room.** Explain the purpose of each piece of equipment (hardware, software, video camera, microphones, etc.), how it is used in the test, and what you will do with any collected data.

I'm going to use this video camera to record what you are doing and saying. As you can see, the camera will only be pointing at the sketch and your hands, not your face. I'll use this video to review our session later for things I may have missed. No one else but me will ever see this video. Are you ok with that?
We have found that we get a great deal of information from these informal tests if we ask people to think aloud as they work through the exercises. It may be a bit awkward at first, but it's really very easy once you get used to it. All you do is speak your thoughts as you work. If you forget to think aloud, I'll remind you to keep talking. Would you like me to demonstrate?

**E. Explain that you cannot provide help.** Participants should work with your product without any interference or extra help, as it will reveal how they would really interact with the product. The exception is when you see a problem that may stop them from going on, or that leads to excessive frustration. In that case (and perhaps after a bit of time has passed) you can step in and give them a hint. This will let them continue, where you can uncover problems later in the task sequence.

**F. Describe the tasks and introduce the product.** Explain what the participant should do and in what order. Explain that because he is working over a sketch, that you may be able to simulate only a few of the system's responses.
G. Ask if there are any questions before you start. Then begin the observation.

Ok, you asked me to visit the home page of this on-line store, and try to buy a shirt over it. So I’m looking for something like ‘start shopping’. Hmm. I can’t find it. But there is this button called directories. Maybe it’s under that? No, that’s not it – it is a bunch of phone numbers. Ok, how do I get back to the main screen? I'll click the store icon. Oops, that’s not the page I saw before; it looks like the corporate headquarters page, not the shopping page. Ugggh. I’m not sure what to do next…

H. If the participant stops talking, remind him.

… What are you thinking? What are you trying to do? Can you tell me what you are looking for?

I. Conclude the observation. When the test is over, explain what you were trying to find out during the test, answer any remaining questions the participant may have, discuss any interesting behaviors you would like the participant to explain. This could include the participant's own thoughts about where things went wrong and possible design suggestions.

USE THE RESULTS

As you observe, you see users doing things you never expect them to do. If you see a participant struggling or making mistakes, you should attribute the difficulties to faulty product design, not to the participant. To get the most out of your test results, review all your data carefully and thoroughly (as captured in your notes and the video). Look for places where participants had trouble, and see if you can determine how your design could be changed to alleviate the problems. Look for patterns in the participants’ behavior that might tell you whether the product was understood correctly.
1. Getting Warmed Up
To get you ‘in the groove,’ try a think-aloud test using an existing software system. A web page to (say) an airline site would be an excellent example. Create a few tasks, starting from a simple one to increasingly complex ones. For example:
   a. Find a flight that goes from here to Los Angeles, leaving tomorrow.
   b. Find the cheapest flight that goes between these two cities, where you would prefer to leave late in the day but come back first thing in the morning a week later.
   c. Find an itinerary that goes from here to London, stops in London for two days, then continues on to New Delhi, and then returns here a week after that.

2. Using the Fax Machine Sketch
Using the fax machine sketch from Chapter 6.1, do a usability test of it. For example:
   a. Here is a 1-page fax. Send it to 222-3333.
   b. You think the fax machine can save phone numbers so you can recall them later. Save the number 222-3333 to the fax machine. Once you’ve done that, recall it and send that fax to it again.

Note that you may have trouble with the above, as you don’t know how this particular fax machine works and thus can’t really simulate what will happen using Wizard of Oz. But try it anyway – you will still learn a lot about where people will stumble.

3. Using Your Own Sketch
Once you’ve tried this, take a sketch you developed, create several tasks for it (going from the most basic to something a bit more complex), and run a test on it.

References

YOU NOW KNOW
Think aloud reveals what people are thinking as they try out your sketch. It is one of the most frequently used usability test methods, is cheap, fast to do, and produces a rich amount of information.