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Improving your human-computer interface: a practical technique

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Appendix 1

Cooperative Evaluation: A run-time guide

INTRODUCTION

What is Cooperative Evaluation?

Cooperative Evaluation is a procedure for obtaining data about problems experienced when working with a software product, so that changes can be made to improve the product.

Who uses Cooperative Evaluation?

Cooperative Evaluation can be used by designers without specialised knowledge of human factors research.

When to use Cooperative Evaluation

Cooperative Evaluation is most useful for early feedback about re-design in a rapid iterative cycle. The aim is not to provide an exhaustive list of all the problems that could possibly be identified. Rather, it is to help you identify, with the minimum of effort, the most important problems to consider.

Cooperative evaluation can be used with:

- an existing product that is to be improved or extended;
- with an early partial prototype or simulation;
- with a full working prototype.

About this guide

This guide is intended as a 'stand alone' reference guide to Cooperative Evaluation. It is intended to help you prepare and run a Cooperative Evaluation session.

It is not a detailed description of the technique, this can be found in Chapter 2. Rather it is a series of questions, summaries, reminders and checklists for each stage of preparing and running a session. We suggest that the best way to use this guide is to photocopy it and use the checklists when appropriate as you progress through the procedure.

The guide is divided into the four steps discussed in Chapter 2. These reflect the four main activities of a successful evaluation session.

(1) Recruit users

(2) Prepare tasks

(3) Interact and record

(4) Debrief

1. RECRUIT USERS

A. Define the target user population

Before you can say whether someone is typical or atypical of the eventual users of the product you have to define who those eventual users will be. If the product is to be used by a specified department or group of individuals then the existing employees define this population. Simply write the name of the group in the box below. The development of more generic products will be preceded by market research which will specify the user group. Even if the population is not defined for you, make an explicit decision to aim at some target user population.

Who are the eventual end users of this product?

B. Recruit users who are as similar to the target user population as is practical

We suggest you work with between 1 and 5 users per iteration early in the design process. Precisely how many will depend on practical requirements such as: how much time you have, how long it will take to run each session (see Prepare Tasks below) and how much time your users have.

How many users will you work with?

Where you get your users from will depend on who you have specified as the target user population in A. above. The table below suggests some possibilities.

Target population	Suggested source of users
A specified company, department or group of people?	Ask the company, department or group
The general public	Advertise in newspapers
People with specific experience or skills	Use recruitment or secretarial agency
Don't know	Make up a 'user profile' and recruit people who fit the description

Things to watch out for during recruitment

1) If you are NOT recruiting directly from an identified group, have you checked that the people you recruit have the same characteristics as your target users? Important considerations are:

- Their knowledge of the task domain?
- Their experience of computers?
- Their skill at using keyboards and other input devices?
- Their level of education and how they will approach situations that require problem solving?

2) Do you need to make arrangements to pay users? Do you need to seek permission for them to take time out of their normal work?

<i>Where will you get your users from?</i>
<i>Whose permission will be required?</i>
<i>What administrative arrangements will need to be made?</i>

Notes:

2. PREPARE TASKS

Selecting the right tasks is crucial for the success of Cooperative Evaluation. They must be do-able by the users, they must be representative of real tasks the users do and they must explore the prototype thoroughly.

The aim of this step is to prepare a Task Sheet. This will contain a list of tasks that all your users will attempt to work through with your prototype. The task sheet is given to the user at the beginning of the Cooperative Evaluation session.

QUESTIONS TO ASK YOURSELF	
Questions	Answers and comments
Have you made sure that the tasks you have planned can actually be done using your prototype?	
Are they going to focus the user on the parts of the prototype you are interested in?	
How much time have you allowed for each user in total?	
How long do you estimate it will take each user just to complete the tasks?	
Is the total time you have allowed at least 50% greater than the time to complete the tasks?	
Have you written down the tasks in a way that can be understood by a novice user?	

Things to watch out for when preparing tasks

- 1) Are the tasks specific? "Do your normal work" is not a specific task. "Draw a house with a door, four windows and a chimney" is.
- 2) How do you know that the tasks you have chosen are representative of the work the product is designed to support? You may have talked

to users about their job, you may have spoken to market research or other specialists in the company.

3) What are you going to do if the user can't finish a task or if a user finishes too quickly? You may want to decide on a maximum time for each task. You may want some extra tasks up your sleeve that are easier or that can be given to people who finish more quickly than you expected.

4) Important functions should be examined twice, once at the beginning and once at the end of the session.

Notes:

3. INTERACT AND RECORD

This section is divided into three parts, telling what you need to do:

- (A) Before the user arrives
- (B) When the user arrives (before she starts the tasks)
- (C) While the user is using the system
- (D) Debriefing the user

A. Before the users arrive

Everything needs to be in place, tested and fully operational. Use the following two checklists. The first lists all the things you need. The second lists everything you should have done.

Have you got the following?	Answers and comments
Your prototype ready to use in a reasonably quiet environment? A sheet containing the user's tasks? Some means of recording what the user says, ideally a clip on microphone plugged into the video recorder (see below)? Some means of recording what the user does (i.e., a video recorder or a system logger?) A notebook or proforma sheet on which to make notes A list of questions to ask during debriefing?	

Have you done the following?	Answers and comments
Planned what you need to say when the user arrives? (see next section) Worked through the task sheet yourself so that you know what to expect? Checked that the recording apparatus is working correctly?	

B. When the users arrive

The whole session should be conducted in an informal manner and you and the users should discuss the system openly. They should be encouraged to think of themselves as co-evaluators not as experimental subjects. They should be told that you are interested in the way the system *misleads them* rather than in the *mistakes they make*. They should be told you are interested in the things that *the system makes it hard for them to do* rather than the things that *they are unable to do*. This emphasises that it is the system that is being evaluated not the user. This will help the question-answer dialogue to flow easily.

When the users arrive and before they start work on the tasks there are five things you need to do.

1. Put the users at their ease.
2. Start recording the session. Do this early on in case you forget later.
3. Introduce yourself. Explain who you are and the purpose of the session in general terms. Emphasise that you are testing the prototype system not the user. Explain the philosophy of Cooperative Evaluation.
4. Explain Cooperative Evaluation. You will need to describe the technique of Cooperative Evaluation. Explain that what the user says will be taped and that everything is confidential.
5. Introduce the task sheet. Explain that the tasks are not a test, just a way of introducing the user to the various parts of this new system.

We think this part of the session is best done informally so we DO NOT recommend that you have a written set of instructions. But we included some written instructions below to give you an idea of what you need to say.

Sample instructions for Cooperative evaluation.

Thank you for agreeing to help with this study. Today we are going to evaluate the usability of a particular computer system called REF.

REF stores large numbers of references to academic works rather like the catalogues in a library. It can be used to search for things written on a particular subject, or by a particular author and so on.

The aim of the study is to find out how easy REF is to use by people like yourself. We want you to use it to help us find out what problems REF poses and how it could be improved.

We will give you some standard tasks to do using REF. The aim of this is to allow us to get some information about how REF supports this activity. We're particularly interested in situations in which REF encourages you to make errors in selecting commands and misleads you about what it will do. We are also interested in extra commands that would make the system easier to use.

To get this information we shall use a question-and-answer technique. This involves three things.

1. We want you to think-out-loud as you do each task, telling us how you are trying to solve each task, which commands you think might be appropriate and why, and what you think the machine has done in response to your commands and why. Think of this as you giving us a running commentary on what you are doing and thinking.
2. Whenever you find yourself in a situation where you are unsure about what to do or what effect commands might have, ask us for advice. If you ask us what you need to know we will suggest things for you to try but if you get really stuck we'll explain exactly what you have to do.
3. In addition we will ask you questions about what you are trying to do and what effect you expect the commands you type will have. This is simply to find out what problems there are with the system. During our conversations, we want you to voice any thoughts you have about parts of the system which you feel are difficult to use or poorly designed.

While you're doing this we'll be noting down the problems you mention but in case we miss any we are going to audio tape our conversation. This recording will be anonymous and treated in confidence.

Remember it's not you we're testing, it's REF. We are interested in what you think so don't treat this as an examination. Treat it as a structured discussion about REF. Please feel free to say whatever you think about the system and the tasks you're given to solve.

C. While the users are using the system

The two main things to remember to do when the users are actually carrying out the task are

KEEP THEM TALKING!
MAKE SURE YOU KNOW WHAT'S GOING ON!

1. Encourage the users to think aloud while using the system. This is best done by asking them to give you a running commentary of what they are doing and what's going on.
2. Ensure that there is a relatively continuous dialogue by asking appropriate questions whenever possible. There is a list of useful questions at the bottom of this page. These can be photocopied and used as a 'crib sheet' during the session.
3. Note each occurrence of unexpected behaviour and each comment on the usability of the system. You will not have time to make detailed notes. What you need to do is make a note of where on the tape the behaviour or comment occurred and a brief (possibly one word) description of what happened. A proforma for this is included at the end of this section. Do not let note taking interfere with the primary task of creating a dialogue with the user. Stop note taking rather than let this happen.

Unexpected Behaviour is where the users do something the designer didn't intend them to do. For example, the user might type in an inappropriate sequence of commands or data

Comments are subjective comments or evaluations of the interface. These can be both positive and negative ("It's nice the way you can do that without having to type the whole thing again", "That seemed to take a lot of effort", "I don't like having to do that twice" and so on).

Some useful questions to ask during evaluation

- How do we do that?
- What do you want to do?
- What will happen if.....?
- What has the system done now?
- What is the system trying to tell you with this message?
- Why has the system done that?
- What were you expecting to happen then?
- What are you doing now?
- What were you expecting to happen then?

D. De-briefing

When the user has finished the set tasks you should spend some time talking about the session. Keep the tape recorder on during this time. Some very interesting comments emerge out of this part of the session. As well as discussing what each of you think are important usability problems you can also get some feedback about the Cooperative Evaluation session itself. Some useful questions to ask the user are included at the end of this section. These can be photocopied and used as a 'crib sheet'. These questions are however very general, you will probably want to ask some fairly specific questions of your own about specific aspects of the prototype such as menu names, default values and so on.

If you are testing lots of users or you want more formal feedback, it may be worth considering drawing up a simple questionnaire for the users to fill in. Be careful not to make it too long or complicated. A good example of such a questionnaire is included in Chapter 3 as Figure 3.3.

It is sometimes possible to see users a second time either individually or as a group. If this is possible it is very useful. It allows you the opportunity of clarifying your interpretation of important usability problems and also discussing possible design changes. It also serves a useful customer relations function bring users and designers together for a round table discussion. This is discussed in more detail in Chapter 3.

Some useful questions to ask during debriefing

About the prototype

- What do you think was the best thing about the prototype?
- What do you think was the worst thing about the prototype?
- What do you think most needs changing?
- How easy did you find the tasks?
- *Specific questions about the prototype....*

About Cooperative Evaluation

- Did you find the recording equipment intrusive?
- Were the tasks similar to things you currently do?
- How realistic did you find the prototype?

Sample Proforma sheet for making notes

No.	Tape count	Unexpected behaviour or Comment
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		