2

User Profiles

CHAPTER CONTENTS

PURPOSE

There is no single best user interface style or approach for any and all types of users. Specific interface design alternatives that optimize the performance of some types of users may actually degrade the performance of other types of users. For example, an infrequent, casual user needs an easy-to-learn and easy-to-remember interface, but a high-frequency, expert user needs an efficient, powerful, and flexible interface. These are not necessarily the same thing. Similarly, a highly skilled typist might perform better with a keyboard-oriented interface, while a low-skill typist might do better with a GUI.

Unless User Interface Designers (see Chapters 1 and 21 for definitions of all Usability Engineering roles) know the specific characteristics of a population of users (e.g., expected frequency of use, level of typing skill), they cannot make optimal user interface design decisions for them. The purpose of a User Profile is thus to establish the general requirements of a category of users in terms of overall interface style and approach.

If you want an immediate and concrete sense of what a User Interface Designer needs to know about the users and why, skip to the Sample Work Products and Templates section later in the chapter, read it, and then return here.

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DESCRIPTION

For the User Profile task, you must first determine who will use the planned product. How you do this depends on what type of development

organization you are working in, and the procedure is described in the later section Sample Technique—A Step-by-Step Procedure. After you determine who your users are, you obtain a description of the whole user population in terms of characteristics relevant to user interface design. These characteristics include

- Psychological characteristics (e.g., attitude, motivation)
- Knowledge and experience (e.g., typing skill, task experience)
- Job and task characteristics (e.g., frequency of use, task structure)
- Physical characteristics (e.g., color blindness)

You can determine user characteristics by gathering data through interviews and/or a User Profile questionnaire (see the Sample Work Products and Templates section later in the chapter). In the case of vendor organizations, certain User Profile data can also be obtained indirectly from marketing personnel. In the case of internal development organizations and contract developers, some User Profile data can be obtained indirectly from human resources personnel.

From the summarized data, you draw high-level conclusions regarding interface design requirements and document these in a narrative format (see the Sample Work Products and Templates section).

A separate User Profile should be summarized for each significant category of users (e.g., doctors, technicians, nurses, receptionists) within a market segment or business unit. You should perform the data collection and analysis part of this task only once for each significant user category. Then for each new product intended for that user category, simply refer to the relevant User Profile conclusions and design implications.

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If you work for a vendor company, as opposed to an internal development company or contract development organization, you might think that it will be difficult to identify actual users and get questionnaire responses from them. If your product is new, rather than a new release of a current product, maybe you are not even sure who your users will be. In such cases, when products are radical innovations, it may indeed be difficult to identify and get access to representative potential users, and doing a User Profile might be next to impossible. You may have to wait until your initial product is out and perform a User Profile before designing your second release or related products.

But often, even in a vendor situation, users are well known and accessible. You will find that marketing and sales organizations have good con-

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tacts in customer organizations, and in fact themselves have a lot of useful knowledge about users that you can tap into just by asking the right questions. Often customers are invested in your future products and will give you access to users. If not, or if your product is intended for the general public, you can provide incentives (e.g., payment, discounts, or entries in a raffle) for potential users to participate in a questionnaire study. In my experience, in the vast majority of situations, it is possible to get User Profile data in some form.

It is important to revalidate User Profiles every few years, especially if user populations are changing due to turnover or new hiring practices. For example, one of my clients knew that a large percentage of users in a particular category would retire over the next several years. They also knew that management planned to hire replacements who were younger and better educated. Thus, there was a planned change in the User Profile for that user category, and we incorporated this expected User Profile into our designs.

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Scheduling and Integration with Other Tasks

Certain interdependencies exist between Usability Engineering Lifecycle tasks themselves and between Usability Engineering Lifecycle tasks and standard software development lifecycle tasks. Tasks must be scheduled so that the output from each task can provide essential input to other tasks. In each chapter on a specific task, this section describes the relationship of the task to the whole process.

The User Profile task fits into the overall Usability Engineering Lifecycle in the following ways:

- The User Profile task is the first task in the Usability Engineering Lifecycle.
- This task feeds directly into the Contextual Task Analysis task by identifying categories of users whose tasks and work environment must be studied in that later task.
- This task feeds directly into the Usability Goal Setting task because usability goals are in part driven directly by user characteristics (e.g., a low frequency of use indicates a need for ease of learning and

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remembering). Thus, different usability goals will be extracted from the profiles of different categories of users.

- Ultimately, the User Profile task will have a direct impact on all design tasks, which focus on realizing usability goals, which in turn are based in part on User Profiles.
- This task will also drive the selection of usability evaluation issues and test users.
- Output from this task will be documented in the product Style Guide.

The User Profile task fits into the underlying software development methodology in the following ways:

- This task can *parallel, overlap,* or *follow* development of the Requirements Model in the Analysis phase in OOSE (or function and data modeling in the requirements phase of a traditional rapid prototyping methodology). It could either define Actors for the Requirements Model or take the definition of user categories from the Requirements Model as its starting point.
- This task (along with all other Usability Engineering Lifecycle Requirements Analysis tasks) should precede development of the Analysis Model in the Analysis phase of OOSE (or the application architecture design in a traditional rapid prototyping methodology).

ROLES AND RESOURCES

For each task, certain Usability Engineering roles, such as the Usability Engineer and the User Interface Designer, should participate. These and other Usability Engineering roles are defined briefly in Chapter 1 and in detail in Chapter 21. This section describes how the roles work together to accomplish each task.

If the questionnaire technique is used in the User Profile task (see the next section), the usability roles might participate as follows:

Task leader: A Usability Engineer should direct this task, bringing to bear his or her skills in questionnaire design and data analysis. The Usability Engineer should also at least direct, review, and provide significant input to the conclusions drawn from the questionnaire data.

Other resources: Project team members and/or the User Interface Designer can carry out most of the main steps of this task. Users would

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participate in the design of the questions, in the pilot questionnaire, and as the ultimate respondents of the final questionnaire.

If the interview technique is used (see Alternative Techniques—A Review), the usability roles might participate as follows:

Task leader: The User Interface Designer could take main responsibility for the task.

Other resources: A Usability Engineer will be useful in helping to decide which user characteristics to profile and also in drawing conclusions. Other project team members can carry out the steps. User representatives would serve as interviewees.

SAMPLE TECHNIQUE—A STEP-BY-STEP PROCEDURE

There are two main ways to obtain a User Profile, depending on available time and other resources: questionnaires distributed to actual users or interviews with people knowledgeable about the whole population of users. The technique that produces the most accurate and reliable results is to gather data directly from intended users through a questionnaire. This can be time consuming and requires a skill set that includes questionnaire design and data analysis. However, once a User Profile is obtained through this method, it can be reused across applications for the user population profiled, and thus the cost of obtaining it can be "amortized" across projects, reducing the actual cost per development project.

The following steps describe how to obtain a User Profile in the most reliable and accurate way—using a questionnaire. I also refer you to the Sample Work Products and Templates section of Chapter 17 for an example of a report from a questionnaire study that also provides insights into the use of questionnaires as a general information-gathering technique.

❶ **Determine user categories.** First you must determine who the intended users for a product are. Often they fall into already defined categories (e.g., doctor, nurse, technician, receptionist). How you determine users and user categories depends in part on what kind of development organization you work in.

If you work for an internal development organization or a contract development organization, the business unit for which a product is being developed will in most cases already have a definition of users, usually by job category. Defining the users is

puter users, when questionnaires are properly motivated, has been much higher. In a vendor company with internal users, I got a return rate of 33 percent out of 180 questionnaires distributed, while in an insurance company, I got back 75 percent of 400 distributed. In a police department, on the other hand, with the signature of a high-ranking officer on the cover letter, I got 100 percent—800 out of 800 returned! As a rule of thumb, until your own in-house experience proves otherwise, assume a response rate of no more than 30 percent from internal users and no more than 10 percent from external users.

Unless the total population is very large (over about 3,000), aim for a final sample of 10 percent of the total population. With internal users, this means sending out questionnaires to a minimum of roughly 33 percent, expecting to get 30 percent of these back (with external users you might have to send out 100 percent to get 10 percent back). When user populations exceed about 3,000, as is often the case in a vendor situation, it becomes impractical to distribute and analyze questionnaires from even as little as 10 percent of the total population. In these cases, aim for a final sample of at least 100 or so users *from each significant user category.*

Representative sampling is very important. Make sure to send questionnaires to equal numbers of each known, significant user category (e.g., physicians, nurses, technicians, receptionists). If the first distribution does not produce roughly equal returns from each category, send a second distribution to underrepresented categories. Also sample representatively within each major user category. For example, in an insurance company, perhaps major user categories include clerical staff, managers, and claims adjusters, but there are two distinct types of claims adjusters and two distinct types of managers, and all user types reside in different geographical locations, some of which are currently more automated than others. In this case, include equal numbers of the five categories of users in the initial distribution, and try to include equal numbers from the various locations and various levels of automation within those categories.

9. **Distribute the questionnaires.** You can use interoffice mail, regular mail, or email (but don't use email if it is likely to cause a bias in response; i.e., only some users routinely use email, and thus only they will get it and respond). Make returns as easy as possible. For example, if using regular mail, include a preaddressed, stamped envelope for returns. Give a clear return deadline, but also encourage users who miss the deadline to return the questionnaire whenever they can.

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⑩ **Design data entry/analysis.** Using a spreadsheet, statistics package, tailored data entry and analysis program, or just paper, pencil, and calculator, design a data entry format and analysis technique, assuming an ultimate data summary format similar to the template in the Sample Work Products and Templates section (two data entry and analysis templates are shown). Also plan to collate and summarize any free-form comments.

⑪ **Enter data.** As questionnaires are received, enter data as planned.

⑫ **Summarize data.** When all questionnaires are returned, or upon the deadline date (perhaps allowing a grace period of several days), analyze data as planned and produce a data summary similar in format to the template included in the Sample Work Products and Templates section.

⑬ **Interpret data.** Here it is particularly useful to have a Usability Engineer take the lead (see Chapters 1 and 21 for definitions of all Usability Engineering roles). Write a short (several pages) summary providing a synopsis of the key characteristics of each user category and drawing specific implications for user interface design. Do not make any assumptions about the relative importance of different categories of users at this point. Summarize the general needs of each different user category and variations within the category.

For example, if managers were found to be primarily low-frequency, computer-illiterate, and computer-phobic users, while clerical users were found to be mostly high-frequency, computer-literate users with positive attitudes towards technological tools, the general needs of the former could be summarized as *ease of learning* and remembering, and the general needs of the latter as *ease of use*, flexibility, and power. Then examples of how to achieve these general goals could be offered. For more information on how User Profile data should drive design decisions, see Mayhew (1992, ch. 2).

The Sample Work Products and Templates section offers a sample of User Profile conclusions and design implications. Which user category to favor in the overall interface (if any) will be decided on during Usability Goal Setting, a later task.

⑭ **Present results.** Distribute the narrative conclusions and design implications, with the data summary form as an appendix, to all interested parties, including at least the User Interface Designer and other project team members. The results should also be folded into the product Style Guide (see Chapter 14). If appropriate, summarize these work products in an oral presentation as well.

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